



## Record 1

Title: Residential landscapes in suburban China from the perspective of growth coalitions: Evidence from Beijing

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Source: JOURNAL OF CLEANER PRODUCTION Volume: 223 Pages: 620-630 DOI: 10.1016/j.jclepro.2019.03.145 Published: JUN 20 2019 Document Type:Article

Abstract: Residential landscapes in China manifest characteristics different from those seen in Western countries: high density, facilities improvement, and good quality. This study investigates residential landscape by developing a novel framework to capture a growth coalition that is composed of local government and real estate enterprises. Stemming from institutional insights, this study assumes that the growth coalition in China attempts to acquire residential land far from built-up areas to reduce costs, increase the floor area ratio and the green rate, and promote accessibility and walkability to improve housing prices. Taking Beijing as a case, we first identify the residential expansion type (renewal, infill, edge, outlying). Then, two models are created: the land acquisition cost model and the housing price model. The results provide a good argument in support of our hypothesis. This study contributes institutional knowledge to support an understanding of residential landscapes and urban sustainability in China.

## Record 2

Title: Ticks and tick-borne diseases in the city: Role of landscape connectivity and green space characteristics in a metropolitan area

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Source: SCIENCE OF THE TOTAL ENVIRONMENT Volume: 670 Pages: 941-949 DOI: 10.1016/j.scitotenv.2019.03.235 Published: JUN 20 2019 Document Type:Article

Abstract: Green spaces in the city are important for human wellbeing, but are also zones in which humans can become infected with zoonotic diseases. Therefore, there is a need to understand how infection risk is related to green space characteristics, wildlife communities and connectivity with rural areas hosting reservoir populations of hosts. Our hypothesis is that wildlife hosts in urban green spaces, and thereby the prevalence of questing ticks and their Lyme disease causing pathogens (*Borrelia burgdorferi* s.l.), can be partly predicted based on green space characteristics as well as measures of connectivity to known source areas. We sampled ticks in twenty-two green spaces during Spring (2014 and 2016) and Autumn 2016, located along an urbanization gradient in Antwerp (Belgium). More than 18,000 m<sup>2</sup> was sampled, with tick densities ranging from 0 to 386 individuals/100 m<sup>2</sup>. We estimated connectivity using the least-cost algorithm as either the cost distance to the nearest green space, or to a known population of roe deer (*Capreolus capreolus*), known to be an important tick propagation host. Both connectivity measures turned out to be correlated, reflecting a gradient in green space isolation from the periphery to the urban center. In 87% of plots where ticks were trapped, at least one *Borrelia*-infected tick was found. The overall *Borrelia*-prevalence in nymphs was 17.8%, in adults 32.6%. Density of infected ticks decreased with urbanization and increased with connectivity. Nymphs in larger green spaces were more likely to be infected. While density and infection prevalence for adults increased with the amount of neighboring agricultural land, the larval density and nymphal infection prevalence decreased. Interestingly, the proportion of *Borrelia* genospecies associated with birds or mammals was comparable in rural and (sub)urban areas (bird/mammal: 0.38), suggesting that even in small green spaces *Borrelia* infections can persist in local host populations.

## Record 3

**Title:** Identifying the optimal body shape and composition associated with strength outcomes in children and adolescent according to place of residence: An allometric approach

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**Source:** JOURNAL OF SPORTS SCIENCES Volume: 37 Issue: 12 Pages: 1434-1441 DOI: 10.1080/02640414.2018.1562615 Published: JUN 18 2019 Document Type:Article

**Abstract:** The purpose of the study was to identify the optimal body shape and composition associated with physical fitness levels of children living in urban and rural areas of Italy. A total of 7102 children (11-14 years) were assessed for weight, height, percentage body fat (FM%), sit-and-reach flexibility (SAR), standing broad jump (SBJ) and sit-ups (SUP). A multiplicative allometric model,  $Y = a \text{ Greek ano teleia mass}(k1) \text{ Greek ano teleia height}(k2) \text{ Greek ano teleia epsilon}$ , was used to predict the physical outcome variables  $Y = \text{SBJ and SUP}$ . The model was expanded to incorporate FM% and SAR as follows  $Y = a \text{ Greek ano teleia mass}(k1) \text{ Greek ano teleia height}(k2) \text{ Greek ano teleia FM\%}(k3) \text{ Greek ano teleia exp}(b \text{ Greek ano teleia FM\%} + c \text{ Greek ano teleia SAR}) \text{ Greek ano teleia epsilon}$ . Note that FM% was incorporated as a "gamma function" that allows an initial growth, and subsequent decline in  $Y$  as FM% increases in size. Although having an ectomorph body shape appears advantageous, being too thin appears detrimental to the strength outcomes. Being flexible would also benefit physical fitness levels. Finally, our results indicate that urban children aged 11-14 have superior strength outcomes compared with rural children, having controlled for differences in body shape and composition, a finding that may be associated with rural environments having fewer exercise facilities compared with urban conurbations.

#### Record 4

**Title:** Spending at least 120 minutes a week in nature is associated with good health and wellbeing

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**Source:** SCIENTIFIC REPORTS Volume: 9 Article Number: 7730 DOI: 10.1038/s41598-019-44097-3 Published: JUN 13 2019 Document Type:Article

**Abstract:** Spending time in natural environments can benefit health and well-being, but exposure-response relationships are under-researched. We examined associations between recreational nature contact in the last seven days and self-reported health and well-being. Participants ( $n = 19,806$ ) were drawn from the Monitor of Engagement with the Natural Environment Survey (2014/15-2015/16); weighted to be nationally representative. Weekly contact was categorised using 60 min blocks. Analyses controlled for residential greenspace and other neighbourhood and individual factors. Compared to no nature contact last week, the likelihood of reporting good health or high well-being became significantly greater with contact  $\geq 120$  mins (e.g. 120-179 mins: ORs [95% CIs]: Health = 1.59 [1.31-1.92]; Well-being = 1.23 [1.08-1.40]). Positive associations peaked between 200-300 mins per week with no further gain. The pattern was consistent across key groups including older adults and those with long-term health issues. It did not matter how 120 mins of contact a week was achieved (e.g. one long vs. several shorter visits/ week). Prospective longitudinal and intervention studies are a critical next step in developing possible weekly nature exposure guidelines comparable to those for physical activity.

#### Record 5

**Title:** The built environment and active transportation safety in children and youth: a study protocol

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Belton, K (Belton, Kathy)[ 11 ] ; Buliung, R (Buliung, Ron)[ 12 ] ; Emery, CA (Emery, Carolyn A.)[ 13 ] ; Faulkner, G (Faulkner, Guy)[ 14 ] ; Kennedy, J (Kennedy, Jacqueline)[ 15 ] ; Ma, T (Ma, Tracey)[ 16,17 ] ; Macarthur, C (Macarthur, Colin)[ 18 ] ; McCormack, GR (McCormack, Gavin R.)[ 19 ] ; Morrow, G (Morrow, Greg)[ 20 ] ; Nettel-Aguirre, A (Nettel-Aguirre, Alberto)[ 21,22 ] ; Owens, L (Owens, Liz)[ 23 ] ; Pike, I (Pike, Ian)[ 24,25 ] ; Russell, K (Russell, Kelly)[ 26 ] ; Torres, J (Torres, Juan)[ 27 ] ; Voaklander, D (Voaklander, Donald)[ 11 ] ; Embree, T (Embree, Tania)[ 28 ] ; Hubka, T (Hubka, Tate)[ 29,30 ]

Source: BMC PUBLIC HEALTH Volume: 19 Article Number: 728 DOI: 10.1186/s12889-019-7024-6  
Published: JUN 11 2019 Document Type:Article

Abstract: BackgroundActive transportation, such as walking and biking, is a healthy way for children to explore their environment and develop independence. However, children can be injured while walking and biking. Many cities make changes to the built environment (e.g., traffic calming features, separated bike lanes) to keep people safe. There is some research on how effective these changes are in preventing adult pedestrians and bicyclists from getting hurt, but very little research has been done to show how safe various environments are for children and youth. Our research program will study how features of the built environment affect whether children travel (e.g., to school) using active modes, and whether certain features increase or decrease their likelihood of injury. MethodsFirst, we will use a cross-sectional study design to estimate associations between objectively measured built environment and objectively measured active transportation to school among child elementary students. We will examine the associations between objectively measured built environment and child and youth pedestrian-motor vehicle collisions (MVCs) and bicyclist-MVCs. We will also use these data to determine the space-time distribution of pedestrian-MVCs and bicyclist-MVCs. Second, we will use a case-crossover design to compare the built environment characteristics of the site where child and youth bicyclists sustain emergency department reported injuries and two randomly selected sites (control sites) along the bicyclist's route before the injury occurred. Third, to identify implementation strategies for built environment change at the municipal level to encourage active transportation we will conduct: 1) an environmental scan, 2) key informant interviews, 3) focus groups, and 4) a national survey to identify facilitators and barriers for implementing built environment change in municipalities. Finally, we will develop a built environment implementation toolkit to promote active transportation and prevent child pedestrian and bicyclist injuries. DiscussionThis program of research will identify the built environment associated with active transportation safety and form an evidence base from which municipalities can draw information to support change. Our team's national scope will be invaluable in providing information regarding the variability in built environment characteristics and is vital to producing evidence-based recommendations that will increase safe active transportation.

## Record 6

Title: Exploring the links between population density, lifestyle, and being overweight: secondary data analyses of middle-aged and older Chinese adults

Author(s): Wang, RY (Wang, Ruoyu)[ 1,2 ] ; Feng, ZX (Feng, Zhixin)[ 3 ] ; Xue, DS (Xue, Desheng)[ 1,2 ] ; Liu, Y (Liu, Ye)[ 1,2 ] ; Wu, R (Wu, Rong)[ 1,2 ]

Source: HEALTH AND QUALITY OF LIFE OUTCOMES Volume: 17 Article Number: 100 DOI: 10.1186/s12955-019-1172-3 Published: JUN 11 2019 Document Type:Article

Abstract: BackgroundThe increasing prevalence of obesity across all age groups has become a major health concern in China. Previous studies have found strong links between population density, sedentary lifestyle, and the risk of being overweight among adults and adolescents in Western countries. However, little research has been conducted to disentangle this relationship in China, which is rapidly urbanizing and densely populated. Compared to other age groups, middle-aged and older adults tend to have a higher risk of being overweight, which increases their risk of diabetes, high blood pressure, and other weight-related chronic diseases. In addition, they are especially sensitive to neighbourhood environmental factors such as population density. Therefore, we aimed to unravel the link between population density and the risk of being overweight among Chinese middle-aged and older adults, with a particular focus on the mediating role of lifestyle choices. MethodsData from the 2011 China Health and Retirement Longitudinal Study were analysed. Individuals (N=5285) were sampled from 405 neighbourhoods nested within 150 cities. Body

Mass Index (BMI) was calculated based on self-reported body weight and height (being overweight was defined as a BMI  $\geq 24$  kg/m<sup>2</sup>). Multilevel regression and mediation analyses were applied to explore associations between population density, a sedentary lifestyle, and the risk of being overweight. Results Middle-aged and older adults who lived in densely populated neighbourhoods had higher odds of being overweight. Further, this link was mediated by residents' mode of travel and physical exercise; specifically, these residents had higher odds of owning a car and spending lesser time on weekly physical exercise, thereby increasing their risk of being overweight. Furthermore, the association between car ownership and the odds of being overweight varied by neighbourhood population density. Conclusions There was a positive association between neighbourhood population density and middle-aged and older adults' risk of being overweight. This relationship may exist because people who live in densely populated neighbourhoods tend to lead a sedentary lifestyle. Our findings also suggest that, in rapidly urbanizing countries, a sedentary lifestyle may be especially harmful to middle-aged and older adults who live in densely populated neighbourhoods.

## Record 7

Title: The Park Prescription Study: Development of a community-based physical activity intervention for a multi-ethnic Asian population

Author(s): Uijtdewilligen, L (Uijtdewilligen, Leonie)[ 1 ] ; Waters, CNH (Waters, Clarice Nhat-Hien)[ 1 ] ; Aw, S (Aw, Su)[ 1 ] ; Wong, ML (Wong, Mee Lian)[ 1 ] ; Sia, A (Sia, Angelia)[ 2 ] ; Ramiah, A (Ramiah, Anbumalar)[ 3 ] ; Wong, M (Wong, Michael)[ 3 ] ; Muller-Riemenschneider, F (Mueller-Riemenschneider, Falk)[ 1,4 ]

Source: PLOS ONE Volume: 14 Issue: 6 Article Number: e0218247 DOI: 10.1371/journal.pone.0218247  
Published: JUN 11 2019 Document Type: Article

Abstract: This mixed-methods study aims to inform the development of a 'Park Prescription' intervention, including face-to-face counseling on physical activity and park use and providing weekly structured exercise sessions in the park to promote physical activity. Participants aged 40-65 years were recruited from regional health screening events in Singapore where they completed a questionnaire (N = 97) and consented to focus group (FG) participation (N = 16). The questionnaire assessed current park use, and the type, duration, and intensity of park-based activities that would be of interest. FGs explored the barriers and facilitators of physical activity (in parks). Short interviews (N = 16) with 'doers', i.e., people already engaging in park-based physical activity, identified motivational factors and ways to overcome common barriers. Participants acknowledged the health benefits of parks and valued them because of their pleasant landscapes, greenery and facilities. However, few participants engaged in physical activity at the parks, because they were too busy or too tired. Participants mostly indicated doing informal activities, such as walking, cycling or playing traditional Asian games when using the parks for exercise. A variety of low-to-moderate intensity park-based activities such as walking, cycling or aerobics were of interest to participants who expressed the willingness to engage in structured exercise sessions on weekday evenings or weekend mornings. Strategies to increase physical activity in parks included: encourage planning, create social support, identify alternatives for bad weather, improve proximity/accessibility to parks and park safety. The effectiveness of the Park Prescription intervention in promoting physical activity, park use, as well as physical and mental wellbeing will be tested in a one-year Randomized Controlled Trial.

## Record 8

Title: Using data from online geocoding services for the assessment of environmental obesogenic factors: a feasibility study

Author(s): Prager, M (Prager, Maximilian)[ 1,2 ] ; Kurz, C (Kurz, Christoph)[ 1,2 ] ; Bohm, J (Boehm, Julian)[ 1,2 ] ; Laxy, M (Laxy, Michael)[ 1,2 ] ; Maier, W (Maier, Werner)[ 1,2 ]

Source: INTERNATIONAL JOURNAL OF HEALTH GEOGRAPHICS Volume: 18 Article Number: 13 DOI: 10.1186/s12942-019-0177-9 Published: JUN 7 2019 Document Type: Article

**Abstract:** Background The increasing prevalence of obesity is a major public health problem in many countries. Built environment factors are known to be associated with obesity, which is an important risk factor for type 2 diabetes. Online geocoding services could be used to identify regions with a high concentration of obesogenic factors. The aim of our study was to examine the feasibility of integrating information from online geocoding services for the assessment of obesogenic environments. Methods We identified environmental factors associated with obesity from the literature and translated these factors into variables from the online geocoding services Google Maps and OpenStreetMap (OSM). We tested whether spatial data points can be downloaded from these services and processed and visualized on maps. True- and false-positive values, false-negative values, sensitivities and positive predictive values of the processed data were determined using search engines and in-field inspections within four pilot areas in Bavaria, Germany. Results Several environmental factors could be identified from the literature that were either positively or negatively correlated with weight outcomes in previous studies. The diversity of query variables was higher in OSM compared with Google Maps. In each pilot area, query results from Google showed a higher absolute number of true-positive hits and of false-positive hits, but a lower number of false-negative hits during the validation process. The positive predictive value of database hits was higher in OSM and ranged between 81 and 100% compared with a range of 63-89% for Google Maps. In contrast, sensitivities were higher in Google Maps (between 59 and 98%) than in OSM (between 20 and 64%). Conclusions It was possible to operationalize obesogenic factors identified from the literature with data and variables available from geocoding services. The validity of Google Maps and OSM was reasonable. The assessment of environmental obesogenic factors via geocoding services could potentially be applied in diabetes surveillance.

## Record 9

**Title:** Assessment of personal exposure to particulate air pollution: the first result of City Health Outlook (CHO) project

**Author(s):** Liang, L (Liang, Lu)[ 1 ] ; Gong, P (Gong, Peng)[ 2,3 ] ; Cong, N (Cong, Na)[ 2,3 ] ; Li, ZC (Li, Zhichao)[ 2,3 ] ; Zhao, Y (Zhao, Yu)[ 2,3 ] ; Chen, Y (Chen, Ying)[ 2,3 ]

**Source:** BMC PUBLIC HEALTH Volume: 19 Article Number: 711 DOI: 10.1186/s12889-019-7022-8  
Published: JUN 7 2019 Document Type: Article

**Abstract:** Background To mitigate air pollution-related health risks and target interventions towards the populations bearing the greatest risks, the City Health Outlook (CHO) project aims to establish multi-scale, long-lasting, real-time urban environment and health monitoring networks. A major goal of CHO is to collect data of personal exposure to particulate air pollution through a full profile that consists of a matrix of activities and micro-environments. As the first paper of a series, this paper is targeted at illustrating the characteristics of the participants and examining the effects of different covariates on personal exposure at various air pollution exposure levels. Methods In the first campaign, volunteers are recruited to wear portable environmental sensors to record their real-time personal air pollution exposure and routes. After a web-based social media recruitment strategy, 50 eligible subjects joined the first campaign in Beijing from January 8 to January 20, 2018. The mean personal exposures were measured at 19.36, 37.65, and 43.45g/m<sup>3</sup> for particulate matter (PM) with a diameter less than 1, 2.5, and 10μm, respectively, albeit with the high spatial-temporal variations. Results Unequal distribution of exposures was observed in the subjects with different sociodemographic status, travel behavior, living and health conditions. Quantile regression analysis reveals that subjects who are younger, less educated, exposed to passive smoking, low to middle household income, overweight, without ventilation system at home or office, and do not possess private vehicles, are more susceptible to PM pollution. The differences, however, are generally insignificant at low exposure levels and become evident on bad air quality days. Conclusions The heterogeneity in personal exposure found in this the first CHO campaign highlighted the importance of studying the pollution exposure at the individual scale. It is at the critical stage to bridge the knowledge gap of environmental inequality in different populations, which can lead to great health implications.

## Record 10

**Title:** Probabilistic walking models using built environment and sociodemographic predictors

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Source: POPULATION HEALTH METRICS Volume: 17 Article Number: 7 DOI: 10.1186/s12963-019-0186-8 Published: JUN 3 2019 Document Type:Article

Abstract: Background Individual sociodemographic and home neighborhood built environment (BE) factors influence the probability of engaging in health-enhancing levels of walking or moderate-to-vigorous physical activity (MVPA). Methods are needed to parsimoniously model the associations. Methods Participants included 2392 adults drawn from a community-based twin registry living in the Seattle region. Objective BE measures from four domains (regional context, neighborhood composition, destinations, transportation) were taken for neighborhood sizes of 833 and 1666 road network meters from home. Hosmer and Lemeshow's methods served to fit logistic regression models of walking and MVPA outcomes using sociodemographic and BE predictors. Backward elimination identified variables included in final models, and comparison of receiver operating characteristic (ROC) curves determined model fit improvements. Results Built environment variables associated with physical activity were reduced from 86 to 5 or fewer. Sociodemographic and BE variables from all four BE domains were associated with activity outcomes but differed by activity type and neighborhood size. For the study population, ROC comparisons indicated that adding BE variables to a base model of sociodemographic factors did not improve the ability to predict walking or MVPA. Conclusions Using sociodemographic and built environment factors, the proposed approach can guide the estimation of activity prediction models for different activity types, neighborhood sizes, and discrete BE characteristics. Variables associated with walking and MVPA are population and neighborhood BE-specific.

## Record 11

Title: Trends in Sedentary and Physical Activity Behaviors in Incarcerated Adolescent Boys During a Sports, Play, and Recreation for Kids Program

Author(s): Brusseau, TA (Brusseau, Timothy A.)[ 1 ] ; Burns, RD (Burns, Ryan D.)[ 1 ] ; Hannon, JC (Hannon, James C.)[ 2 ]

Source: AMERICAN JOURNAL OF HEALTH PROMOTION Volume: 33 Issue: 5 Pages: 760-763 DOI: 10.1177/0890117118812666 Published: JUN 2019 Document Type:Article

Abstract: Purpose: To examine the trends in total and segmented sedentary and physical activity behaviors during a Sports, Play, and Recreation for Kids (SPARK) program in incarcerated adolescent boys. Design: Longitudinal trend analysis. Setting: Two juvenile justice facilities. Subjects: Eighty-six adolescent boys (mean age = 17.1 1.0 years). Intervention: Sports, Play, and Recreation for Kids implemented over 36 weeks. Measures: Sedentary times and physical activity were examined at baseline and at 3 follow-up time points at 12, 24, and 36 weeks after SPARK implementation. Physical activity was assessed using the percentage of accelerometer wear time within each segment for sedentary (%SED) and moderate-to-vigorous physical activity (%MVPA). Analysis: Trends in %SED and %MVPA were assessed using 2 x 4 doubly multivariate analysis of variance tests. Results: For the total week, there was a significantly lower %SED (mean difference = -10.6%,  $P < .001$ ) and significantly higher %MVPA (mean difference = +3.0%,  $P < .001$ ) at the 24-week follow-up compared to baseline. There were also significantly lower %SED and higher %MVPA before school, after school, and during the weekends at 24-week follow-up compared to baseline ( $P < .01$ ). Conclusion: There were significantly lower sedentary times and higher levels of physical activity during the middle portions of the SPARK intervention in incarcerated adolescent boys, highlighting the potential of this intervention to affect sedentary and physical activity behaviors in the population.

## Record 12

Title: Walkable Urban Design Attributes and Japanese Older Adults' Body Mass Index: Mediation Effects of Physical Activity and Sedentary Behavior

Author(s): Koohsari, MJJ (Koohsari, Mohammad Javad Javad)[ 1,2,3 ] ; Kaczynski, AT (Kaczynski, Andrew T.)[ 4,5 ] ; Nakaya, T (Nakaya, Tomoki)[ 6 ] ; Shibata, A (Shibata, Ai)[ 7 ] ; Ishii, K (Ishii, Kaori)[ 1 ] ; Yasunaga, A (Yasunaga, Akitomo)[ 8 ] ; Stowe, EW (Stowe, Ellen W.)[ 4 ] ; Hanibuchi, T (Hanibuchi, Tomoya)[ 9 ] ; Oka, K (Oka, Koichiro)[ 1 ]

Source: AMERICAN JOURNAL OF HEALTH PROMOTION Volume: 33 Issue: 5 Pages: 764-767 DOI: 10.1177/0890117118814385 Published: JUN 2019 Document Type:Article

Abstract: Purpose: The purposes of this study were to examine associations between objectively measured walkable urban design attributes with Japanese older adults' body mass index (BMI) and to test whether objectively assessed physical activity and sedentary behavior mediated such associations. Design: Cross-sectional. Setting: Matsudo City, Chiba Prefecture, Japan. Participants: Participants were 297 older residents (aged 65-84 years) randomly selected from the registry of residential addresses. Measures: Walkable urban design attributes, including population density, availability of physical activity facilities, intersection density, and access to public transportation stations, were calculated using geographic information systems. Physical activity, sedentary behavior, and BMI were measured objectively. Analysis: The relationships of walkable urban design attributes, Walk Score (R), and BMI were examined by multiple linear regression with adjustment for covariates in all models. Mediation effects of the physical activity and sedentary behavior variables in these relationships were tested using a product-of-coefficients test. Results: Higher population density and Walk Score (R) were associated with lower BMI. Light and moderate-to-vigorous physical activities partially mediated the relationships between these walkable urban design attributes and BMI. Conclusions: Developing active-friendly environmental policies to (re)design neighborhoods may not only promote active transport behaviors but also help in improving residents' health status in non-Western contexts.

### Record 13

Title: A Meta-analysis of the Literature on the Association of the Social and Built Environment With Obesity: Identifying Factors in Need of More In-Depth Research

Author(s): Zhang, H (Zhang, Hao)[ 1 ] ; Yin, L (Yin, Li)[ 1 ]

Source: AMERICAN JOURNAL OF HEALTH PROMOTION Volume: 33 Issue: 5 Pages: 792-805 DOI: 10.1177/0890117118817713 Published: JUN 2019 Document Type:Review

Abstract: Objective: This study aims to identify groups of the social and built environment factors that have been studied substantially along with factors that need further attention, to guide the research, designing, and planning of the social and built environment for reducing obesity prevalence. Data Source: A systematic search of literature was undertaken from PubMed, Google Scholar, and Web of Knowledge. Study Inclusion and Exclusion Criteria: Keyword combination of built environment, social environment, and obesity were used to expand the search scope. Exclusion criteria included (1) any article with less than 50 citations from 2005 to 2010, and those with less than 25 citations from 2011 to 2015. In this way we included the most prominent peer-reviewed studies published in recent years while excluding less influential publications; (2) any article published in a language other than English; (3) literature review articles; (4) any article studying health outcomes not obesity related. We included research on eating behaviors since the studies contributed profoundly to food environment research. Data Synthesis: A meta-analysis of 153 empirical studies, selected from 2005 to 2015 based on a series of criteria, was conducted using factor analysis. The exploratory factor analysis was undertaken to group the prevalence and use of the social and built environment factors associated with obesity. Results: The findings suggested that the research community has gained a substantial understanding of the D variables of the built environment, including density, diversity, design, distance to transit, and destination access. Factors concerning different age groups, minority populations, groups with low socioeconomic status, food environment, and street-level urban design features have been less examined. Conclusions: The findings are important to guide future research directions, giving more attention to the factors in need of more in-depth research.

### Record 14

**Title:** Does time spent in the residential neighbourhood moderate the relationship between neighbourhood walkability and transport-related walking? a cross-sectional study from Toronto, Canada

**Author(s):** Chum, A (Chum, Antony)[ 1,2 ] ; Atkinson, P (Atkinson, Peter); O'Campo, P (O'Campo, Patricia)[ 2 ]

**Source:** BMJ OPEN Volume: 9 Issue: 4 Article Number: e023598 DOI: 10.1136/bmjopen-2018-023598  
Published: JUN 2019 Document Type:Article

**Abstract:** Objectives Studies have investigated the influence of neighbourhood walkability on residents' walking behaviour, aiming to increase physical activity and reduce dependence on automobiles. Previous research, however, has not considered how the amount of time spent in the residential neighbourhood may modify this relationship. Our objective was to determine how time spent in the residential neighbourhood affects the relationship between neighbourhood walkability and walking for transport. Design Using a cross-sectional sample of 2411 adults, we analysed the association between walkability (an index combining land-use mix, dwelling density and street connectivity) and transport-related walking (controlling for the effects of gender, age, income, self-rated health and regular access to private transport) testing for interactions by time spent in the neighbourhood. Primary outcome measure Minutes spent walking for transport per week. Setting Toronto, Canada. Participants Participants were aged 25 to 65. The survey had a 72% response rate. Results After adjusting for potential confounders, the walkability index was weakly associated with walking (1 SD of walkability score is associated with 0.25 more minutes walking/week,  $p < 0.01$ ). Land-use mix was more strongly associated with walking than the walkability index. Time spent at the residential neighbourhood modified the relationship between land-use mix and transport-related walking in a dose-effect manner ( $p < 0.01$ ), those spending 5 hours on average at their residential neighbourhood have 0.2 min/day more walking for each additional land-use mix score and those spending 12 hours have 0.5 min/day more walking for each additional land-use mix score. Conclusions Our findings suggest that walkability is associated with increased walking time, but it is modified by time spent in the neighbourhood. Our study underscores the importance of testing 'time spent in the neighbourhood' as a modifier of environmental exposures in studies of environmental correlates of walking.

## Record 15

**Title:** Longitudinal access and exposure to green-blue spaces and individual-level mental health and well-being: protocol for a longitudinal, population-wide record-linked natural experiment

**Author(s):** Mizen, A (Mizen, Amy)[ 1 ] ; Song, J (Song, Jiao)[ 1 ] ; Fry, R (Fry, Richard)[ 1 ] ; Akbari, A (Akbari, Ashley)[ 1 ] ; Berridge, D (Berridge, Damon)[ 1 ] ; Parker, SC (Parker, Sarah C.)[ 1 ] ; Johnson, R (Johnson, Rhodri)[ 1 ] ; Lovell, R (Lovell, Rebecca)[ 2 ] ; Lyons, RA (Lyons, Ronan A.)[ 1 ] ; Nieuwenhuijsen, M (Nieuwenhuijsen, Mark)[ 3 ] ; Stratton, G (Stratton, Gareth)[ 4 ] ; Wheeler, BW (Wheeler, Benedict W.)[ 2 ] ; White, J (White, James)[ 5 ] ; White, M (White, Mathew)[ 2 ] ; Rodgers, SE (Rodgers, Sarah E.)[ 1,6 ]

**Source:** BMJ OPEN Volume: 9 Issue: 4 Article Number: e027289 DOI: 10.1136/bmjopen-2018-027289  
Published: JUN 2019 Document Type:Article

**Abstract:** Introduction Studies suggest that access and exposure to green-blue spaces (GBS) have beneficial impacts on mental health. However, the evidence base is limited with respect to longitudinal studies. The main aim of this longitudinal, population-wide, record-linked natural experiment, is to model the daily lived experience by linking GBS accessibility indices, residential GBS exposure and health data; to enable quantification of the impact of GBS on well-being and common mental health disorders, for a national population. Methods and analysis This research will estimate the impact of neighbourhood GBS access, GBS exposure and visits to GBS on the risk of common mental health conditions and the opportunity for promoting subjective well-being (SWB); both key priorities for public health. We will use a Geographic Information System (GIS) to create quarterly household GBS accessibility indices and GBS exposure using digital map and satellite data for 1.4 million homes in Wales, UK (2008-2018). We will link the GBS accessibility indices and GBS exposures to individual-level mental health outcomes for 1.7 million people with general practitioner (GP) data and data from the National Survey for Wales ( $n$ =similar to 12

000) on well-being in the Secure Anonymised Information Linkage (SAIL) Databank. We will examine if these associations are modified by multiple sociophysical variables, migration and socioeconomic disadvantage. Subgroup analyses will examine associations by different types of GBS. This longitudinal study will be augmented by cross-sectional research using survey data on self-reported visits to GBS and SWB. Ethics and dissemination All data will be anonymised and linked within the privacy protecting SAIL Databank. We will be using anonymised data and therefore we are exempt from National Research Ethics Committee (NREC). An Information Governance Review Panel (IGRP) application (Project ID: 0562) to link these data has been approved. The research programme will be undertaken in close collaboration with public/patient involvement groups. A multistrategy programme of dissemination is planned with the academic community, policy-makers, practitioners and the public.

## Record 16

**Title:** A theory-based, task-oriented, outdoor walking programme for older adults with difficulty walking outdoors: protocol for the Getting Older Adults Outdoors (GO-OUT) randomised controlled trial

**Author(s):** Salbach, NM (Salbach, Nancy M.)[ 1,2 ] ; Barclay, R (Barclay, Ruth)[ 3 ] ; Webber, SC (Webber, Sandra C.)[ 3 ] ; Jones, CA (Jones, C. A.)[ 4 ] ; Mayo, NE (Mayo, Nancy E.)[ 5 ] ; Lix, LM (Lix, Lisa M.)[ 6 ] ; Ripat, J (Ripat, Jacquie)[ 7 ] ; Grant, T (Grant, Theresa)[ 8 ] ; van Ineveld, C (van Ineveld, Cornelia)[ 9 ] ; Chilibeck, PD (Chilibeck, Philip D.)[ 10 ]

**Source:** BMJ OPEN Volume: 9 Issue: 4 Article Number: e029393 DOI: 10.1136/bmjopen-2019-029393  
Published: JUN 2019 Document Type:Article

**Abstract:** Introduction A theory-based, task-oriented, community walking programme can increase outdoor walking activity among older adults to optimise functional independence, social participation and well-being. The study objective is to determine if there is a difference in the change in outdoor walking activity from baseline to 10 weeks, 5.5 months and 12 months after receiving a 1-day interactive workshop and outdoor walking programme (Getting Older Adults Outdoors (GO-OUT)) compared with the workshop and weekly reminders (WR) in older adults with difficulty walking outdoors. Methods and analysis A randomised controlled trial is being conducted in four urban Canadian communities. We will stratify 240 individuals by site and participant type (ie, individual vs spousal/friend pair) and randomise to either the GO-OUT or WR intervention. The GO-OUT intervention involves a 1-day workshop, where participants complete eight interactive stations to build knowledge and skills to walk outside, followed by a 10-week group outdoor walking programme (two 1-hour sessions/week) led by a physiotherapist or kinesiologist in parks. The WR intervention consists of the same workshop and 10 weekly telephone reminders to facilitate outdoor walking. The primary outcome measure is mean outdoor walking time in minutes/week derived from accelerometry and global positioning system data. GO-OUT is powered to detect an effect size of 0.4, given  $\alpha=0.05$ ,  $\beta=0.20$ , equal number of participants/group and a 20% attrition rate. Secondary outcomes include physical activity, lifespace mobility, participation, health-related quality of life, balance, leg strength, walking self-efficacy, walking speed, walking distance/endurance and mood. Ethics and dissemination GO-OUT has received ethics approval at all sites. A Data Safety Monitoring Board will monitor adverse events. We will disseminate findings through lay summaries, conference presentations and journal articles.

## Record 17

**Title:** Multiple Health Behaviors Engagement in an African American Cohort: Clustering Patterns and Correlates

**Author(s):** Cho, D (Cho, Dalnim)[ 1 ] ; Nguyen, NT (Nguyen, Nga T.)[ 1 ] ; Strong, LL (Strong, Larkin L.)[ 1 ] ; Wu, IHC (Wu, Ivan H. C.)[ 1 ] ; John, JC (John, Jemima C.)[ 1 ] ; Escoto, KH (Escoto, Kamisha H.)[ 1 ] ; Wetter, DW (Wetter, David W.)[ 2 ] ; McNeill, LH (McNeill, Lorna H.)[ 1 ]

**Source:** HEALTH EDUCATION & BEHAVIOR Volume: 46 Issue: 3 Pages: 506-516 DOI: 10.1177/1090198119826207 Published: JUN 2019 Document Type:Article

**Abstract:** We investigated class clustering patterns of four behaviors-physical activity, fruit and vegetable (F&V) intake, smoking, and alcohol use-in a faith-based African American cohort. Guided by socio-ecological models, we also examined the psychosocial and neighborhood social environmental factors associated with the clustering patterns. Participants were 1,467 African American adults recruited from a mega church in the metropolitan Houston, TX, in 2008-2009. They completed a survey and health assessment. Latent class analysis and multinomial regression analysis were conducted. Results supported a three-class model: Class 1 was characterized by low physical activity, low F&V intake, and low substance use (smoking and alcohol use). Class 2 was characterized by high physical activity, low F&V intake, and mild drinking. Class 3 seemed to be the healthiest group, characterized by high physical activity, moderate-to-high F&V intake, and low substance use. The probabilities of being included in Classes 1, 2, and 3 were .33, .48, and .19, respectively. Participants in Class 1 (vs. Class 3) reported lower physical activity norm ( $p < .001$ ) and higher smoking norm ( $p = .002$ ) and lower neighborhood social cohesion ( $p = .031$ ). Participants in Class 2 (vs. Class 3) reported higher cancer risk perception ( $p < .001$ ), lower F&V norm ( $p = .022$ ), lower physical activity norm ( $p < .001$ ), higher smoking norm ( $p < .001$ ), and lower social cohesion ( $p = .047$ ). As health behaviors are clustered together, future interventions for African Americans may consider targeting multiple health behaviors instead of targeting a single health behavior. Interventions addressing social norm and neighborhood social cohesion may enhance multiple health behaviors engagement in this population.

### **Record 18**

**Title:** Introducing nature-based solutions into urban policy - facts and gaps. Case study of Poznan

**Author(s):** Zwierzchowska, I (Zwierzchowska, Iwona)[ 1 ] ; Fagiewicz, K (Fagiewicz, Katarzyna)[ 1 ] ; Ponizy, L (Ponizy, Lidia)[ 1 ] ; Lupa, P (Lupa, Piotr)[ 1 ] ; Mizgajski, A (Mizgajski, Andrzej)[ 1 ]

**Source:** LAND USE POLICY Volume: 85 Pages: 161-175 DOI: 10.1016/j.landusepol.2019.03.025  
Published: JUN 2019 Document Type:Article

**Abstract:** Cities often don't appreciate the benefits of green infrastructure (GI) enough. To recognise the extent to which green infrastructure and nature-based solutions (NbS) are present in the urban policy, we conducted a review of planning, strategic and programming documents of Poznan City as a Case Study. The study is aimed at 1) diagnosing of current position NbS in the tasks and directions of planning, strategic and programming documents; 2) characteristic of activities related to NbS according to the form of human-nature interaction; 3) determining the potential of including NbS in the local policy; 4) identifying the role of NbS in facing 4 main challenges in urban policy: resilience and climate change adaptation, health and well-being, social cohesion, economic development potential. The results show that a significant number of actions focus on GI changes towards its multifunctionality and better quality, while there are not many actions towards supporting citizens in using it. Also, despite urban pressure, new green spaces are still planned to be created. The role of NbS within GI in urban resilience is well recognised. Yet, the adaptation to climate change has gained a low priority so far. Linkages between GI and the wellbeing of inhabitants are well understood. However, the possibility to build and strengthen social cohesion based on GI is rather marginally noticed. The least recognised is the influence of NbS on the economic development potential. It is an area that still needs to be investigated to bring evidence in this field. We conclude that to support large-scale, nature-based solution implementation in cities, the crucial step is to bring them into the local urban agenda. An evaluation of urban policy documents based on the presented approach can serve as a guideline for identifying gaps and potentials for NbS inclusion. As a result, it can help the better organisation of urban policy and harmonisation of different sectors through NbS.

### **Record 19**

**Title:** Do Poorer Children Have Poorer Playgrounds? A Geographically Weighted Analysis of Attractiveness, Cleanliness, and Safety of Playgrounds in Affluent and Deprived Urban Neighborhoods

**Author(s):** Buck, C (Buck, Christoph)[ 1 ] ; Bolbos, A (Bolbos, Anca)[ 2 ] ; Schneider, S (Schneider, Sven)[ 2 ]

Source: JOURNAL OF PHYSICAL ACTIVITY & HEALTH Volume: 16 Issue: 6 Pages: 397-405 DOI: 10.1123/jpah.2018-0177 Published: JUN 2019 Document Type:Article

Abstract: Background: Playgrounds are a central resource when it comes to physical activity among minors. This study assesses the association between area deprivation and the quality of playgrounds. Methods: All playgrounds in the city of Mannheim, Germany (145 km<sup>2</sup>), 311,000 inhabitants) were visited between July 2016 and January 2017 as part of a systematic audit. Each playground's amenities, attractiveness, cleanliness, and safety were operationalized using well-established, validated instruments. Global and geographically weighted regression models were fitted to investigate the association of the amenities, attractiveness, cleanliness, and safety of playgrounds with sociodemographic indicators on the social area level. Results: A total of 271 playgrounds were identified. Overall, population density showed the strongest association with all quality variables in the global models, followed by the central official poverty indicator. Significant spatial variation in parameter estimates was found for most of the deprivation indicators with regard to attractiveness, cleanliness, and safety of playgrounds indicating locally negative associations between area-level deprivation and quality. Conclusion: Our findings illustrate the importance of a qualitative approach by analyzing physical activity resources. Concerning the quality of playgrounds, the data from this study support the deprivation amplification hypothesis, meaning that children who are already socially disadvantaged might experience a further contextual disadvantage.

## **Record 20**

Title: Association Between Neighborhood Income, Patterns of Use, and Physical Activity Levels in Fitness Zones of Curitiba, Brazil

Author(s): Alberico, CO (Alberico, Claudia O.)[ 1,2,3,4 ] ; Hipp, JA (Hipp, J. Aaron)[ 3,4 ] ; Reis, RS (Reis, Rodrigo S.)[ 1,2,5,6 ]

Source: JOURNAL OF PHYSICAL ACTIVITY & HEALTH Volume: 16 Issue: 6 Pages: 447-454 DOI: 10.1123/jpah.2018-0234 Published: JUN 2019 Document Type:Article

Abstract: Background: Socioeconomic characteristics of locations where physical activity equipment is installed may affect the activity level of users. The purpose of this study was to verify patterns of use and physical activity levels in fitness zones installed in low-and high-income neighborhoods in the city of Curitiba, Brazil. Methods: Over 1200 observations were conducted in 20 fitness zones in the city of Curitiba, Brazil. Data were collected during the months of November and December 2012, in 4 periods of the day (8 AM, 11 AM, 2 PM, and 5 PM), on 2 weekdays and 2 weekend days. Results: A total of 2232 people were observed in the fitness zones. Age group, level of physical activity in the area, use of fitness zones during weekend days, and occupation of spaces were significantly associated with neighborhood income. Moreover, users of fitness zones located in high-income neighborhoods showed higher odds ratio (OR = 1.74; 95% confidence interval, 1.46-2.07) of moderate to vigorous physical activity than light or sedentary activities, regardless of gender or day of the week. Conclusions: The sole presence of equipment does not seem to favor the use of fitness zones in low-income neighborhoods. Future studies should investigate intrinsic factors for the use of fitness zones for physical activity.

## **Record 21**

Title: Residential mobility in early childhood and the impact on misclassification in pesticide exposures

Author(s): Ling, CX (Ling, Chenxiao)[ 1 ] ; Heck, JE (Heck, Julia E.)[ 1 ] ; Cockburn, M (Cockburn, Myles)[ 2,3,4 ] ; Liew, Z (Liew, Zeyan)[ 5,6 ] ; Marcotte, E (Marcotte, Erin)[ 7 ] ; Ritz, B (Ritz, Beate)[ 1 ]

Source: ENVIRONMENTAL RESEARCH Volume: 173 Pages: 212-220 DOI: 10.1016/j.envres.2019.03.039 Published: JUN 2019 Document Type:Article

Abstract: Studies of environmental exposures and childhood cancers that rely on records often only use maternal address at birth or address at cancer diagnosis to assess exposures in early childhood, possibly leading to exposure misclassification and questionable validity due to residential mobility during early

childhood. Our objective was to assess patterns and identify factors that may predict residential mobility in early childhood, and examine the impact of mobility on early childhood exposure assessment for agriculturally applied pesticides and childhood cancers in California. We obtained the addresses at diagnosis of all childhood cancer cases born in 1998-2011 and diagnosed at 0-5 years of age (n = 6478) from the California Cancer Registry (CCR), and their birth addresses from linked birth certificates. Controls were randomly selected from California birth records and frequency matched (20:1) to all cases by year of birth. We obtained residential histories from a public-record database LexisNexis for both case (n = 3877 with age at diagnosis 1-5 years) and control (n = 99,262) families. Logistic regression analyses were conducted to assess the socio-demographic factors in relation to residential mobility in early childhood. We employed a Geographic Information System (GIS)-based system to estimate children's first year of life exposures to agriculturally applied pesticides based on birth vs diagnosis address or residential histories based upon Lexis-Nexis Public Records and assessed agreement between exposure measures using Spearman correlations and kappa statistics. Over 20% of case and control children moved in their first year of life, and 55% of children with cancer moved between birth and diagnosis. Older age at diagnosis, younger maternal age, lower maternal education, not having a Hispanic ethnic background, use of public health insurance, and non-metropolitan residence at birth were predictors of higher residential mobility. There was moderate to strong correlation (Spearman correlation = 0.76-0.83) and good agreement (kappa = 0.75-0.81) between the first year of life exposure estimates for agricultural pesticides applied within 2 km of a residence relying on an address at birth or at diagnosis or LexisNexis addresses; this did not differ by outcome status, but agreement decreased with decreasing buffer size, and increasing distance moved or age at diagnosis. These findings suggest that residential addresses collected at one point in time may represent residential history in early childhood to a reasonable extent; nevertheless, they exposure misclassification in the first year of life remains an issue. Also, the highest proportion of women not captured by LexisNexis were Hispanic women born in Mexico and those living in the lowest SES neighborhoods, i.e. possibly those with the higher environmental exposures, as well as younger women and those with less than high school education. Though LexisNexis only captures a sub-population, its data may be useful for augmenting address information and assessing the extent of exposure misclassification when estimating environmental exposures in large record linkage studies. Future research should investigate how to correct for exposure misclassification introduced by residential mobility that is not being captured by records.

## **Record 22**

Title: Beyond burial: researching and managing cemeteries as urban green spaces, with examples from Canada

Author(s): Quinton, JM (Quinton, Jessica M.)[ 1 ] ; Duinker, PN (Duinker, Peter N.)[ 1 ]

Source: ENVIRONMENTAL REVIEWS Volume: 27 Issue: 2 Pages: 252-262 DOI: 10.1139/er-2018-0060  
Published: JUN 2019 Document Type:Review

Abstract: Cemeteries existing within cities are often omitted from the "green space" narrative despite their high levels of vegetation. Given the relatively small areas of green space in many cities, it is important to appropriately manage these landscapes to ensure that residents can access green spaces and enjoy the many benefits they offer. The purpose of our paper is to demonstrate that cemeteries should be managed and researched as urban green spaces that provide ecosystem services. We compared and contrasted cemeteries with urban parks and used their similarities and differences, as well as a review of existing cemetery and other green-space literature, to discuss how cemeteries can provide a wide variety of ecosystem services. We found that cemeteries and parks both have high levels of vegetation, similar perceived safety issues, and some common rules and regulations, while differing in their consideration as public spaces, effect on real-estate values, historical-cultural value, and funding and management goals. Despite the differences, we believe that the vegetation (particularly trees), monuments, other infrastructure, and atmosphere within cemeteries make them well-suited to providing ecosystem services such as recreation, human health and restoration, stormwater management, microclimate regulation, aesthetics, and so on. Cemeteries can also potentially provide ecosystem "disservices" such as allergens, invasive/dangerous/poisonous species, and the degradation of groundwater quality. However, we believe

that the potential for ecosystem services far outweighs the potential for ecosystem disservices in urban cemeteries, and as such we believe they should be studied and managed as green spaces with functions beyond those of interment and mourning. Given the general superiority of trees over other vegetation in providing a diversity of ecosystem services, we urge cemetery managers to consider options for increases and improvements in cemetery tree populations.

### **Record 23**

Title: Walking accessibility for individuals with reduced mobility: A Brazilian case study

Author(s): Lima, JP (Lima, Josiane Palma)[ 1 ] ; Machado, MH (Machado, Mariza Helena)[ 1 ]

Source: CASE STUDIES ON TRANSPORT POLICY Volume: 7 Issue: 2 Pages: 269-279 DOI: 10.1016/j.cstp.2019.02.007 Published: JUN 2019 Document Type:Article

Abstract: The objective of this work is to evaluate the accessibility in public spaces from the perspective of the person with reduced mobility. Two methods of evaluation were used: the Analytic Hierarchy Process (AHP), to consider the multiple criteria that define a quantitative index of the pedestrian accessibility; and the Commented Paths Method (Methode des Parcours Commentes) for a qualitative analysis of the practical subjective experience. In order to apply the methods and compare the results, a case study was carried out in the city of Itajuba, in the state of Minas Gerais, Brazil. The results of the application of the methods when compared to the on-site observation, demonstrated coherence with the actual situation. One method complemented the other by providing greater potential for interpretation of the phenomenon, especially by adding individual perceptions, increasing the study's validity. The research provides support for more inclusive public policies, including accessibility with a view for sustainable development and a special focus on social sustainability.

### **Record 24**

Title: Improving walkability in a TOD context: Spatial strategies that enhance walking in the Belem neighbourhood, in Sao Paulo, Brazil

Author(s): Lamour, Q (Lamour, Quentin)[ 1 ] ; Morelli, AM (Morelli, Adriano M.)[ 1 ] ; Marins, KRD (de C Marins, Karin R.)[ 1 ]

Source: CASE STUDIES ON TRANSPORT POLICY Volume: 7 Issue: 2 Pages: 280-292 DOI: 10.1016/j.cstp.2019.03.005 Published: JUN 2019 Document Type:Article

Abstract: Transit-Oriented Development (TOD) is an urban planning strategy that structures urban development at a walking distance from mass public transport stations. Walkability is a central concept in TOD policies. The objective of this paper is to identify and analyse the physical features of the built environment that may impact walkability within the Sao Paulo TOD context. The study intends to highlight the importance of using spatial strategies to qualify the public realm to support the implementation of TOD. Spatial characteristics of the built environment influencing walkability from the literature were tested in the TOD precinct of the Belem metro station, which served as a case study. The distribution of the public open space between the transport modes was quantified. Then, the physical walking conditions and the associated pedestrian traffic and behaviour were analysed. Finally, pedestrians were asked to classify certain spatial characteristics according to their importance for walking. The study showed: safety and security are the most important attributes of public open spaces for pedestrians; land use diversity and commercial ground-floor facades positively influence walkability at the micro-scale; the design of public open spaces leads pedestrians to take unnecessary risks; and a large amount of space, presently dedicated to cars, can be allocated to improve walkability. Based on those findings, the paper highlights the importance of assessing urban development strategies at the micro scale, in order to identify conditions and aspects that are not present on the municipal level and proposes possible concrete actions, as a base to design comprehensive TOD policies that promote pedestrian-oriented public open spaces.

### **Record 25**

Title: Physical Activity Promotion: Highlights from the 2018 Physical Activity Guidelines Advisory Committee Systematic Review

Author(s): King, AC (King, Abby C.)[ 1,2 ] ; Whitt-Glover, MC (Whitt-Glover, Melicia C.)[ 3 ] ; Marquez, DX (Marquez, David X.)[ 4 ] ; Buman, MP (Buman, Matthew P.)[ 5 ] ; Napolitano, MA (Napolitano, Melissa A.)[ 6 ] ; Jakicic, J (Jakicic, John)[ 7 ] ; Fulton, JE (Fulton, Janet E.)[ 8 ] ; Tennant, BL (Tennant, Bethany L.)[ 9 ] ; Buchner, DM (Buchner, David M.); Campbell, WW (Campbell, Wayne W.); DiPietro, L (DiPietro, Loretta); Erickson, KI (Erickson, Kirk, I); Hillman, CH (Hillman, Charles H.); Jakicic, JM (Jakicic, John M.); Janz, KF (Janz, Kathleen F.); Katzmarzyk, PT (Katzmarzyk, Peter T.); Kraus, WE (Kraus, William E.); Macko, RF (Macko, Richard F.); McTieman, A (McTieman, Anne); Pate, RR (Pate, Russell R.); Pescatello, LS (Pescatello, Linda S.); Powell, KE (Powell, Kenneth E.)

Source: MEDICINE AND SCIENCE IN SPORTS AND EXERCISE Volume: 51 Issue: 6 Pages: 1340-1353 DOI: 10.1249/MSS.0000000000001945 Published: JUN 2019 Document Type:Review

Abstract: Purpose This article describes effective interventions to promote regular physical activity and reduce sedentary behavior that were identified as part of the 2018 Physical Activity Guidelines Advisory Committee Scientific Report. Methods A comprehensive literature search was conducted of eligible systematic reviews, meta-analyses, and relevant governmental reports published between 2011 and 2016. For the physical activity promotion question, articles were first sorted by four social ecological levels of impact (i.e., individual, community, communication environment, and physical environment and policy levels) and then further sorted into more specific categories that emerged during the review process. For the sedentary behavior reduction question, the literature was sorted directly into emergent categories (i.e., youth, adult, and worksite interventions). Results Effective physical activity promotion strategies were identified at each level of impact, including those based on behavior change theories and those occurring at different settings throughout the community. Effective interventions also included those delivered in person by trained staff or peer volunteers and through different information and communication technologies, such as by phone, Web or Internet, and computer-tailored print. A range of built environment features were associated with more transit-based and recreational physical activity in children and adults. Effective sedentary reduction interventions were found for youth and in the workplace. Conclusions A promising number of interventions with demonstrated effectiveness were identified. Future recommendations for research include investigating the most useful methods for disseminating them to real-world settings; incorporating more diverse population subgroups, including vulnerable and underrepresented subgroups; collecting cost data to inform cost-effectiveness comparisons; and testing strategies across different levels of impact to determine which combinations achieve the greatest effects on different modes of physical activity across the week.

## **Record 26**

Title: Identifying determinants of obesity in Athens, Greece through global and local statistical models

Author(s): Faka, A (Faka, Antigoni)[ 1 ] ; Chalkias, C (Chalkias, Christos)[ 1 ] ; Georgousopoulou, EN (Georgousopoulou, Ekavi N.)[ 2,3 ] ; Tripitsidis, A (Tripitsidis, Anestis)[ 1 ] ; Pitsavos, C (Pitsavos, Christos)[ 4 ] ; Panagiotakos, DB (Panagiotakos, Demosthenes B.)[ 2 ]

Source: SPATIAL AND SPATIO-TEMPORAL EPIDEMIOLOGY Volume: 29 Pages: 31-41 DOI: 10.1016/j.sste.2019.02.002 Published: JUN 2019 Document Type:Article

Abstract: Individual socioeconomic status is linked to obesity risk, though, less is known about the influence of an area's socio-environmental conditions on obesity/overweight prevalence. This association was investigated using obesity/overweight data collected from 2445 individuals in Athens greater area, who were randomly enrolled in ATTICA study, during 2001 to 2002, and factors related to educational and economic level, population density, immigrants and green urban areas. Thematic mapping illustrated the socio-environmental status and highlighted the obesity/overweight prevalence across the municipalities of Athens. Global statistical models revealed that high socio-environmental status, educational and economic level were inversely associated with obesity/overweight ( $p < 0.001$ ). Furthermore, local Geographically Weighted Regression revealed spatial non-stationarity in the relationship between green urban areas and

obesity/overweight. The findings of the study lead to the better understanding of the factors affecting obesity/overweight and may support the development of policies that target to well-being, decrease of obesity/overweight prevalence and improvement of public health.

#### **Record 27**

Title: Is active travel a breath of fresh air? Examining children's exposure to air pollution during the school commute

Author(s): Gilliland, J (Gilliland, Jason)[ 1,2,3,4,5,6,7 ] ; Maltby, M (Maltby, Matthew)[ 1 ] ; Xu, XH (Xu, Xiaohong)[ 8 ] ; Luginaah, I (Luginaah, Isaac)[ 1 ] ; Loebach, J (Loebach, Janet)[ 1,2,9 ] ; Shah, T (Shah, Tayyab)[ 1,2 ]

Source: SPATIAL AND SPATIO-TEMPORAL EPIDEMIOLOGY Volume: 29 Pages: 51-57 DOI: 10.1016/j.sste.2019.02.004 Published: JUN 2019 Document Type:Article

Abstract: The aim of this study was to assess how children's personal exposure to fine particulate matter (PM<sub>2.5</sub>) during the school commute is influenced by mode of travel and neighborhood environment in a mid-sized Canadian city. A total of 101 commutes to and from school were tracked using a GPS, and personal exposure to PM<sub>2.5</sub> along commute routes was assessed by spatially-referencing the monitored exposure levels with time-synchronized GPS data. Students who walked to and from school were exposed to lower PM<sub>2.5</sub> concentrations than those in cars or riding the school bus. There was also a significant difference in mean PM<sub>2.5</sub> concentrations by the built environment, with children who walked to school in suburban neighborhoods experiencing higher personal concentrations than children in urban neighborhoods. To reduce children's daily exposure to air pollutants, neighborhoods should be designed to maximize the number of children who are able to walk between home and school.

#### **Record 28**

Title: National-level environmental perceptions and walking among urban and rural residents: Informing surveillance of walkability

Author(s): Whitfield, GP (Whitfield, Geoffrey P.)[ 1 ] ; Carlson, SA (Carlson, Susan A.)[ 1 ] ; Ussery, EN (Ussery, Emily N.)[ 1 ] ; Watson, KB (Watson, Kathleen B.)[ 1 ] ; Berrigan, D (Berrigan, David)[ 2 ] ; Fulton, JE (Fulton, Janet E.)[ 1 ]

Source: PREVENTIVE MEDICINE Volume: 123 Pages: 101-108 DOI: 10.1016/j.ypmed.2019.03.019 Published: JUN 2019 Document Type:Article

Abstract: Built environments that provide activity-friendly routes (e.g., sidewalks) to everyday destinations (e.g., shops) can increase physical activity. Surveillance of supports and destinations is important, and identifying which are associated with walking could prioritize surveillance questions. Our purpose was to identify the significant associations between supports and destinations with walking among a nationally-representative sample of urban- and rural-dwelling adults. Participants in the 2015 National Health Interview Survey, Cancer Control Supplement (n = 29,925) reported the near-home presence of walkable supports (roads, sidewalks, paths, or trails; sidewalks on most streets), destinations (shops; transit; movies, libraries, or churches; relaxing places), and past-week walking for leisure or transportation. We used stepwise logistic regression to quantify associations between supports and destinations and walking, including by urban/rural residence. We calculated the prevalence of walking across counts of reported elements by urban/rural residence. Among all participants, roads, sidewalks, paths, or trails and relaxing destinations were associated with leisure walking. Among urban residents, sidewalks on most streets and all four destination types were associated with transportation walking; among rural residents, roads, sidewalks, paths, or trails; movies, libraries, or churches; and relaxing destinations were associated with transportation walking. Walking was more common when more environmental elements were reported. To improve efficiency, communities may match surveillance priorities to behavioral priorities (i.e., leisure versus transportation walking) and environmental context (i.e., urban/rural areas). Surveillance of environments supporting leisure walking might focus on recreation-oriented spaces. Surveillance of

environments supporting transportation walking might differ for urban and rural areas, and assessing destinations may be particularly important.

### **Record 29**

Title: Causal evaluation of urban greenway retrofit: A longitudinal study on physical activity and sedentary behavior

Author(s): Frank, LD (Frank, Lawrence D.)[ 1 ] ; Hong, A (Hong, Andy)[ 2 ] ; Ngo, VD (Ngo, Victor Douglas)[ 1 ]

Source: PREVENTIVE MEDICINE Volume: 123 Pages: 109-116 DOI: 10.1016/j.yjmed.2019.01.011  
Published: JUN 2019 Document Type:Article

Abstract: Studies of the built environment and physical activity (PA) have primarily been cross-sectional. Evidence on the causal impacts of transportation improvements on PA and sedentary behavior (SB) is lacking. This study assessed the effect of retrofitting an urban greenway on PA and SB in Vancouver, Canada. A sample of 524 participants (median age of 44; 57% female) were divided into experimental and control groups, and the effect of exposure to the greenway was examined by using different distance thresholds. Self-report measures of moderate-to-vigorous PA (MVPA) and SB were collected using the International Physical Activity Questionnaire (IPAQ-SF) before (baseline; 2012-2013) and after (follow-up; 2014-2015) construction of the Comox-Helmcken Greenway in 2013. Mixed-effects models estimated the impacts of greenway on MVPA and SB. For participants living near the greenway ( $\leq 300$  m), the odds of achieving an average of 20 min of daily MVPA doubled (OR = 2.00; 95% CI = 1.00, 3.98) after the greenway's opening. The odds of being sedentary for  $> 9$  h declined by 54% (OR = 0.46; 95% CI = 0.25, 0.85) after opening. PA benefits from the greenway declined with distance from 100 m to 500 m. Reduction in SB was lowest at 100 m and greatest at 300 m. Retrofitting an urban residential neighborhood through greenway interventions can be successful in promoting physical activity while reducing sedentary behavior. Recommendations for future longitudinal research include the use of objective PA measures, studying different neighborhood contexts, collecting more representative samples, and minimizing attrition.

### **Record 30**

Title: United States' neighborhood park use and physical activity over two years: The National Study of Neighborhood Parks

Author(s): Evenson, KR (Evenson, Kelly R.)[ 1 ] ; Williamson, S (Williamson, Stephanie)[ 2 ] ; Han, B (Han, Bing)[ 2 ] ; McKenzie, TL (McKenzie, Thomas L.)[ 3 ] ; Cohen, DA (Cohen, Deborah A.)[ 2 ]

Source: PREVENTIVE MEDICINE Volume: 123 Pages: 117-122 DOI: 10.1016/j.yjmed.2019.03.027  
Published: JUN 2019 Document Type:Article

Abstract: The United States lacks surveillance to monitor park use and conditions. The purpose of this study was to use the System for Observing Play and Recreation in Communities (SOPARC) as a surveillance tool to describe the conditions, user characteristics, and physical activity of a national sample of neighborhood parks at two time points. Using a stratified multistage sampling strategy, a representative sample of 174 neighborhood parks in 25 major United States' cities were selected. During 2014 and 2016, park-related use, conditions, and physical activity were assessed using SOPARC in 169 parks. Overall, 74,106 park users were observed at baseline and 69,150 park users were observed two years later ( $p = 0.37$ ). There were persistent disparities in park use by gender and age, with disproportionately more male than female users in each age group (child, teenager, adult, older adult). Older adults used the park less than other age groups. Almost two-thirds of park users were observed being sedentary (61.9% in 2014, 60.7% in 2016), followed by moderate (30.8%, 32.0%) and vigorous (7.3%, 7.3%) activity. Empty target areas increased over two years (75.3%, 77.6%;  $p = 0.01$ ) and those that were equipped (2.6%, 1.2%;  $p = 0.0003$ ), accessible (95.4%, 94.3%;  $p = 0.01$ ), and organized (2.6%, 1.7%;  $p = 0.01$ ) decreased. Areas that were usable (97.5%, 97.4%) or provided supervised activities (2.0%, 2.4%) did not change significantly. The findings demonstrate the value of SOPARC as a surveillance tool, identify user groups under

represented at parks, and suggest an opportunity to encourage more park-based physical activity among park visitors.

### **Record 31**

Title: Age, sex and other correlates with active travel walking and cycling in England: Analysis of responses to the Active Lives Survey 2016/17

Author(s): Brainard, J (Brainard, Julii)[ 1 ] ; Cooke, R (Cooke, Rachel)[ 2 ] ; Lane, K (Lane, Kathleen)[ 1 ] ; Salter, C (Salter, Charlotte)[ 1 ]

Source: PREVENTIVE MEDICINE Volume: 123 Pages: 225-231 DOI: 10.1016/j.ypmed.2019.03.043  
Published: JUN 2019 Document Type:Article

Abstract: Active travel (walking or cycling for transport) can generate personal and environmental benefits. We determined the frequency of participation in walking or cycling active travel by age and sex, as well as used multivariate analysis to find correlations with many other factors using a large cross-sectional 2016/17 survey of people living in England. Walking and cycling active travel were explored separately. Most respondents reported no active travel, but at least 25% of people under age 45 met activity recommendations only from active travel. Otherwise, (unlike other types of physical activity) active travel declined consistently with increased age. Men reported much more cycling active travel than women, who were more likely to do any active travel walking and therefore more likely to meet activity guidelines from just active travel walking. Lower levels of disability, fewer children in household, and working full time increased active travel. Season was sometimes relevant. BMI, personal-effectiveness, deprivation and rurality had mixed relationships with types of active travel. Understanding differences in correlates for cycling vs. walking active travel could help tailor local promotion programmes for each. The analysis suggests that motivators and barriers for active travel greatly by age.

### **Record 32**

Title: Built environment correlates of walking for recreation or exercise

Author(s): Aliyas, Z (Aliyas, Zeinab)[ 1,2 ]

Source: JOURNAL OF PUBLIC HEALTH-HEIDELBERG Volume: 27 Issue: 3 Pages: 349-356 DOI: 10.1007/s10389-018-0956-y Published: JUN 2019 Document Type:Article

Abstract: Abstract BackgroundWalking is known as the most common type of physical activity that may be influenced by the built environment, which in turn may affect the health of residents. The current study aimed at investigating the relationship of the built environment to exercise and recreational walking in residential neighborhoods. MethodFive hundred questionnaires were distributed from March to May 2016 in four residential neighborhoods of Bandar Abbas in Iran, out of which 398 questionnaires turned out to be qualified to be used in the study. Furthermore, the number of parks as well as their total area were estimated within a radius of 1500m from the respondents' living place. ResultsConsidering the participants' gender, the appealing characteristics of built environment were more likely to increase walking activity among females than males. The association between walking patterns and environmental factors was different between male and female residents. In addition, the correlations between walking behavior and some other socio-demographic factors were determined. ConclusionThe present study suggests that urban planners and designers as well as public health promoters need to highly consider the contribution of built environment variables in neighborhoods as well as socio-demographic variables to promote walking behavior changes among the adult population.

### **Record 33**

Title: The effect of built environments on the walking and shopping behaviors of pedestrians; A study with GPS experiment in Sinchon retail district in Seoul, South Korea

Author(s): Hahm, Y (Hahm, Yeankyung)[ 1 ] ; Yoon, H (Yoon, Heeyeun)[ 1,2 ] ; Choi, Y (Choi, Yunwon)[ 3 ]

Source: CITIES Volume: 89 Pages: 1-13 DOI: 10.1016/j.cities.2019.01.020 Published: JUN 2019  
Document Type:Article

Abstract: With this research, we aim to identify built environmental components of retail districts that affect pedestrian behaviors and influence their shopping behavior. We conducted GPS experiments to observe visitors' choice of walking route-pedestrian volume and visit duration-and the questionnaire survey to obtain their records of shopping on where and how much they spent in the Sinchon retail district of Seoul, South Korea. We then employed a path analysis to assess the causal relationship between the built environment, walking behavior, and shopping behavior. We found that pedestrians prefer streets with safety from vehicles, high design quality; higher hierarchy, centrality, and provision of resting places or other street amenities; and that all of these variables also increase pedestrian's visit duration and induce spending at stores on the street. This study would provide design guidelines to municipalities or private retailers looking to revitalize retail districts through environmental improvements.

#### **Record 34**

Title: Neighborhood walkability for subsidized households: Revisiting neighborhood environments of Housing Choice Voucher and Low-Income Housing Tax Credit households

Author(s): Woo, A (Woo, Ayoung)[ 1 ] ; Yu, CY (Yu, Chia-Yuan)[ 2 ] ; Lee, S (Lee, Sugie)[ 3 ]

Source: CITIES Volume: 89 Pages: 243-251 DOI: 10.1016/j.cities.2019.03.002 Published: JUN 2019  
Document Type:Article

Abstract: Scholars and planners have emphasized the importance of the living environments provided to marginalized families by subsidized housing. Many previous studies have focused primarily on the socio-demographics environments of subsidized housing, but it remains unknown if subsidized housing programs facilitate disadvantaged populations' access to walkable environments. Furthermore, little attention has been devoted to the potential differences in walkability of the environments provided by tenant-based programs such as Housing Choice Voucher (HCV), and project-based programs like the Low-Income Housing Tax Credit (LIHTC). This study examined the spatial distribution of HCV and LIHTC housing units and their environmental attributes in the American city of Austin, Texas. Binary logistic regression models were used to estimate various walkable environments around subsidized households. We found that the walkability characteristics varied between the two subsidized housing programs. HCV households were mostly in neighborhoods with high accessibility to amenities and significant sidewalk completeness, but had low densities of crosswalks and transit stops. Meanwhile, LIHTC households were principally found in census block groups characterized by poor sidewalk completeness. Other walkability features, such as the Street Smart Walk Score and the crosswalk density, were not significantly related to neighborhoods containing LIHTC households. These findings will help planning practitioners understand the spatial attributes of subsidized households and better improve their neighborhood walkability.

#### **Record 35**

Title: A pragmatic public health-driven approach to enhance local air quality management risk assessment in Wales, UK

Author(s): Brunt, H (Brunt, Huw)[ 1 ] ; Jones, SJ (Jones, Sarah J.)[ 1 ]

Source: ENVIRONMENTAL SCIENCE & POLICY Volume: 96 Pages: 18-26 DOI: 10.1016/j.envsci.2019.02.008 Published: JUN 2019 Document Type:Article

Abstract: Air pollution, poor health and deprivation are inextricably linked. These stressors can combine to create a triple jeopardy effect where more deprived individuals and communities can be disproportionately affected by exposure to air pollution. Despite acknowledgement of this, however, the current statutory Local Air Quality Management regime prescribes that air pollution risks are considered in isolation. This project

aimed to develop and test application of a practical method for carrying out air pollution risk assessment in the context of wider health determinants. A number of data components describing health, air pollution and deprivation at small area level were identified for one health board area (comprising two local authority areas) in Wales for 2011-15. These data were then combined within each of the triple jeopardy domains and then overall to assign each small area a prioritisation score to inform air quality management action. Areas were then ranked in order with a view to identifying priority areas (and clusters) for integrated air quality management and public health intervention. Local environmental and public health stakeholders were involved throughout the process and asked to provide feedback on the approach, particularly in relation to applying it in practice and evaluating its merit in terms of helping achieve local and national wellbeing policy goals. The piloted tool - called Health and Air Pollution Risk Assessment/Area Prioritisation (HAP-RAP) - offered a contemporary public health-driven approach to risk assessment intended to complement existing [narrow focus] prescribed air quality management approaches. It highlighted areas for action that were different in location, scale and size from local air quality management areas declared through existing processes. Further, stakeholder comments suggested the approach can help support more collaborative, effective and efficient ways of working, facilitate stronger policy and practice integration and achieve greater population health impact.

### **Record 36**

Title: Reassessing NIMBY: The demographics, politics, and geography of opposition to high-density residential infill

Author(s): Whittemore, AH (Whittemore, Andrew H.)[ 1 ] ; BenDor, TK (BenDor, Todd K.)[ 1 ]

Source: JOURNAL OF URBAN AFFAIRS Volume: 41 Issue: 4 Pages: 423-442 DOI: 10.1080/07352166.2018.1484255 Published: MAY 19 2019 Document Type:Article

Abstract: Planners often attempt to accommodate growth in already developed areas. Opposition to high-density (i.e., at a higher unit density than surrounding development) residential infill in developed areas is, however, a long-established force in land use politics. We hypothesize that opposition to this development, as well as 6 specific concerns with this development's impacts, are likely associated with a variety of ideological, demographic, geographical, and political characteristics and that these associations can tell planners much about the character of this opposition. We use a web survey of verified voters in local elections (n = 772) in medium- to medium-high-density ZIP codes to find relationships between these characteristics and respondents' feelings toward a hypothetical high-density residential infill development. Our findings expose the varied character of responses to this development: respondents of some characteristics-for example, those who strongly value their communities' attractiveness, vitality, walkability, and bikability-are more likely to have specific concerns while remaining open to the development, indicating the possibility of constructive conversations with these groups. On the other hand, the concerns of other groups, notably those of conservatives, may result from unfamiliarity or even prejudice.

### **Record 37**

Title: Physical and perceptual gap in indoor environmental quality: a mixed method study of space and users at an aged care facility in Victoria

Author(s): Noguchi, M (Noguchi, Masa)[ 1 ] ; Woo, CMM (Woo, Catherine Mei Min)[ 1 ] ; Chau, HW (Chau, Hing-Wah)[ 1 ] ; Zhou, J (Zhou, Jin)[ 2 ] ; Pianella, A (Pianella, Andrea)[ 1 ] ; Newton, C (Newton, Clare)[ 1 ]

Source: ARCHITECTURAL SCIENCE REVIEW DOI: 10.1080/00038628.2019.1614903 Early Access: MAY 2019 Document Type:Article;

Abstract: Nearly a quarter of a million of Australia's ageing population live in residential aged care facilities. Given the growing ageing population in Australia, it is important to understand the indoor environmental quality (IEQ) of these settings in consideration of not only measurable IEQ data but also senior occupants' perceived comfort for their health and wellbeing. In this research, a residential aged care facility was selected in Victoria, Australia, as a case study to examine these relationships across different seasons.

IEQ monitoring devices were deployed for continuous and instantaneous data collection on site. Questionnaires and personal interviews were also conducted across three user groups (residents, staff and visitors) to establish an understanding of the users' perceptions. This study found the existence of a gap between measurable and perceptual IEQ according to the building configuration and occupancy as well as the user lifestyle and activity.

### **Record 38**

Title: Winter City Urbanism: Enabling All Year Connectivity for Soft Mobility

Author(s): Chapman, D (Chapman, David)[ 1 ] ; Nilsson, KL (Nilsson, Kristina L.)[ 1 ] ; Rizzo, A (Rizzo, Agatino)[ 1 ] ; Larsson, A (Larsson, Agneta)[ 2 ]

Source: JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH Volume: 16 Issue: 10 Article Number: 1820 DOI: 10.3390/ijerph16101820 Published: MAY 2 2019 Document Type:Article

Abstract: This study explores connectivity for soft mobility in the winter season. Working with residents from the sub-arctic city of Lulea, Sweden, the research examines how the interaction between the built environment and winter season affects people's use of the outdoor environment. The research questions for this study are (1) How do residents perceive the effects of winter on an areas spatial structure and pattern of streets and pathways? and (2) What enablers and barriers impact resident soft mobility choices and use of the public realm in winter? Methods used were mental mapping and photo elicitation exercises. These were used to gain a better understanding of people's perception of soft mobility in winter. The results were analysed to identify how soft mobility is influenced by the winter season. The discussion highlights that at the neighbourhood scale, residents perceive that the winter alters an areas spatial structure and pattern of streets and pathways. It was also seen to reduce ease of understanding of the public realm and townscape. In conclusion, it is argued that new and re-tooled town planning strategies, such as extending blue/ green infrastructure planning to include white space could help better enable all year outdoor activity in winter cities.

### **Record 39**

Title: Comparative Associations of Street Network Design, Streetscape Attributes and Land-Use Characteristics on Pedestrian Flows in Peripheral Neighbourhoods

Author(s): Ozbil, A (Ozbil, Ayse)[ 1 ] ; Gurleyen, T (Gurleyen, Tugce)[ 2 ] ; Yesiltepe, D (Yesiltepe, Demet)[ 1 ] ; Zunbuloglu, E (Zunbuloglu, Ezgi)[ 3 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH Volume: 16 Issue: 10 Article Number: 1846 DOI: 10.3390/ijerph16101846 Published: MAY 2 2019 Document Type:Article

Abstract: Research has sufficiently documented the built environment correlates of walking. However, evidence is limited in investigating the comparative associations of micro- (streetscape features) and macro-level (street network design and land-use) environmental measures with pedestrian movement. This study explores the relative association of street-level design-local qualities of street environment-, street network configuration -spatial structure of the urban grid- and land-use patterns with the distribution of pedestrian flows in peripheral neighbourhoods. Street design attributes and ground-floor land-uses are obtained through field surveys while street network configuration is evaluated through space syntax measures. The statistical models indicate that the overall spatial configuration of street network proves to be a stronger correlate of walking than local street-level attributes while only average sidewalk width appears to be a significant correlate of walking among the streetscape measures. However, the most significant and consistent correlate of the distribution of flows is the number of recreational uses at the segment-level. This study contributes to the literature by offering insights into the comparative roles of urban design qualities of the street environment and street network layout on pedestrian movement. The findings also offer evidence-based strategies to inform specific urban design and urban master planning

decisions (i.e., the provision of more generous sidewalks on streets with relatively higher directional accessibility) in creating lively, walkable environments.

#### **Record 40**

Title: Low Childhood Nature Exposure is Associated with Worse Mental Health in Adulthood

Author(s): Preuss, M (Preuss, Myriam)[ 1,2,3,4 ] ; Nieuwenhuijsen, M (Nieuwenhuijsen, Mark)[ 2,3,4 ] ; Marquez, S (Marquez, Sandra)[ 2,3,4 ] ; Cirach, M (Cirach, Marta)[ 2,3,4 ] ; Dadvand, P (Dadvand, Payam)[ 2,3,4 ] ; Triguero-Mas, M (Triguero-Mas, Margarita)[ 2,3,4 ] ; Gidlow, C (Gidlow, Christopher)[ 5 ] ; Grazuleviciene, R (Grazuleviciene, Regina)[ 6 ] ; Kruize, H (Kruize, Hanneke)[ 7 ] ; Zijlema, W (Zijlema, Wilma)[ 2,3,4 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 10 Article Number: 1809 DOI: 10.3390/ijerph16101809 Published: MAY 2 2019  
Document Type:Article

Abstract: Exposure to natural outdoor environments (NOE) is associated with health benefits; however, evidence on the impact of NOE exposure during childhood on mental health (MH) and vitality in adulthood is scarce. This study was based on questionnaire data collected from 3585 participants, aged 18-75, in the PHENOTYPE project (2013) in four European cities. Mixed models were used to investigate associations between childhood NOE exposure and (i) MH; (ii) vitality (perceived level of energy and fatigue); and (iii) potential mediation by perceived amount, use, satisfaction, importance of NOE, and residential surrounding greenness, using pooled and city-level data. Adults with low levels of childhood NOE exposure had, when compared to adults with high levels of childhood NOE exposure, significantly worse mental health (coef. - 4.13; 95% CI -5.52, -2.74). Childhood NOE exposure was not associated with vitality. Low levels of childhood NOE exposure were associated with lower importance of NOE (OR 0.81; 95% CI 0.66, 0.98) in adulthood. The association with perceived amount of NOE differed between cities. We found no evidence for mediation. Childhood NOE exposure might be associated with mental well-being in adulthood. Further studies are needed to confirm these findings and to identify mechanisms underlying long-term benefits of childhood NOE exposure.

#### **Record 41**

Title: Local Housing Characteristics Associated with Early Childhood Development Outcomes in Australian Disadvantaged Communities

Author(s): Villanueva, K (Villanueva, Karen)[ 1,2,3 ] ; Badland, H (Badland, Hannah)[ 2 ] ; Tanton, R (Tanton, Robert)[ 4 ] ; Katz, I (Katz, Ilan)[ 5 ] ; Brinkman, S (Brinkman, Sally)[ 6,7 ] ; Lee, JL (Lee, Ju-Lin)[ 1,3 ] ; Woolcock, G (Woolcock, Geoffrey)[ 8 ] ; Giles-Corti, B (Giles-Corti, Billie)[ 2 ] ; Goldfeld, S (Goldfeld, Sharon)[ 1,3,9 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 10 Article Number: 1719 DOI: 10.3390/ijerph16101719 Published: MAY 2 2019  
Document Type:Article

Abstract: Disadvantaged communities tend to have poorer early childhood development outcomes. Access to safe, secure, and stable housing is a well-known social determinant of health but there is a need to examine key features of neighbourhood housing that reduce early childhood development inequities. The 2012 Australian Early Development Census (AEDC), a population-wide measure of early childhood development, and the Australian Bureau of Statistics Socio-economic Index for Areas Index of Relative Socio-economic Disadvantage were used to select fourteen disadvantaged local communities in five Australian states and territories based on those performing better (off-diagonal), or as expected (on-diagonal) on the AEDC relative to their socio-economic profile. Between 2015-2017, qualitative and quantitative housing data were collected in the local communities. In total, 87 interviews with stakeholders, 30 focus groups with local service providers and parents, and Australian Census dwelling information were analysed. A comparative case study approach was used to examine differences in housing characteristics

(e.g., public housing, density, affordability, and tenure) between disadvantaged local communities performing better than expected' and as expected' on early childhood development. Perceived better housing affordability, objectively measured housing tenure (ownership) and perceived and objectively measured lower-density public housing were housing characteristics that emerged as points of difference for disadvantaged local communities where children had relatively better early childhood development outcomes. These characteristics are potential modifiable and policy sensitive housing levers for reducing early childhood development inequities.

#### **Record 42**

Title: A Systematic Measurement of Street Quality through Multi-Sourced Urban Data: A Human-Oriented Analysis

Author(s): Zhang, LZ (Zhang, Lingzhu)[ 1 ] ; Ye, Y (Ye, Yu)[ 2 ] ; Zeng, WX (Zeng, Wenxin)[ 1 ] ; Chiaradia, A (Chiaradia, Alain)[ 1 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 10 Article Number: 1782 DOI: 10.3390/ijerph16101782 Published: MAY 2 2019  
Document Type:Article

Abstract: Many studies have been made on street quality, physical activity and public health. However, most studies so far have focused on only few features, such as street greenery or accessibility. These features fail to capture people's holistic perceptions. The potential of fine grained, multi-sourced urban data creates new research avenues for addressing multi-feature, intangible, human-oriented issues related to the built environment. This study proposes a systematic, multi-factor quantitative approach for measuring street quality with the support of multi-sourced urban data taking Yangpu District in Shanghai as case study. This holistic approach combines typical and new urban data in order to measure street quality with a human-oriented perspective. This composite measure of street quality is based on the well-established 5Ds dimensions: Density, Diversity, Design, Destination accessibility and Distance to transit. They are combined as a collection of new urban data and research techniques, including location-based service (LBS) positioning data, points of interest (POIs), elements and visual quality of street-view images extraction with supervised machine learning, and accessibility metrics using network science. According to these quantitative measurements from the five aspects, streets were classified into eight feature clusters and three types reflecting the value of street quality using a hierarchical clustering method. The classification was tested with experts. The analytical framework developed through this study contributes to human-oriented urban planning practices to further encourage physical activity and public health.

#### **Record 43**

Title: The Influence of Audio-Visual Interactions on Psychological Responses of Young People in Urban Green Areas: A Case Study in Two Parks in China

Author(s): Zhang, SL (Zhang, Shilun)[ 1 ] ; Zhao, XL (Zhao, Xiaolong)[ 1,2 ] ; Zeng, ZX (Zeng, Zixi)[ 1 ] ; Qiu, X (Qiu, Xuan)[ 1 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 10 Article Number: 1845 DOI: 10.3390/ijerph16101845 Published: MAY 2 2019  
Document Type:Article

Abstract: Audio-visual interactions in green spaces are important for mental health and wellbeing. However, the influence of audio-visual interactions on psychological responses is still less clear. This study introduced a new method, namely the audio-visual walk (AV-walk), to obtain data on the audio-visual context, audio-visual experiences, and psychological responses in two typical parks, namely Cloves Park and Music Park in Harbin, China. Some interesting results are as follows: First, based on Pearson's correlation analysis, sound pressure level and roughness were significantly correlated with psychological responses in Cloves Park ( $p < 0.05$ ). Second, the results of stepwise regression models showed the impact intensity of acoustic comfort was 1.64-1.68 times higher than that of visual comfort on psychological

responses of emotion dimension, while visual comfort was 1.35-1.37 times higher than acoustic comfort on psychological responses of cognition dimension in Music Park. In addition, an orthogonal analysis diagram explained the influence of audio-visual interactions on psychological responses of young people. The audio-visual context located beside the waterscape with a relatively higher level of acoustic and visual comfort was the most cheerful (2.60), relaxed (2.45), and energetic (2.05), while the audio-visual context close to an urban built environment tended to be both acoustically and visually uncomfortable, and the psychological state was decreased to the most depressed (-0.25), anxious (-0.75), fatigued (-1.13) and distracted (-1.13).

#### **Record 44**

Title: Examining the Relationship between Urban Design Qualities and Walking Behavior: Empirical Evidence from Dallas, TX

Author(s): Hamidi, S (Hamidi, Shima)[ 1 ] ; Moazzeni, S (Moazzeni, Somayeh)[ 2 ]

Source: SUSTAINABILITY Volume: 11 Issue: 10 Article Number: 2720 DOI: 10.3390/su11102720  
Published: MAY 2 2019 Document Type:Article

Abstract: This study examines the relationship between street-level urban design perceptual qualities and walking behavior in the City of Dallas. While the city has the potential to experience growth in pedestrian activities, it exhibits a very low level of walking activity, placing it as one of the least walkable cities in the nation. To assess the impact of urban design qualities on walkability, we collected data on 23 features related to urban design, 11 built environment variables characterized as D variables comprising diversity, density, design, distance to transit, and destination accessibility. The sample included 402 street block faces in Dallas Downtown Improvement District. Accounting for spatial autocorrelation, we found that two urban design qualities, among five, including image-ability such as a memorable quality of a place, and transparency as to what degree people can see beyond the street's edge significantly influence pedestrian volume in downtown streets. These findings are in agreement with the two previous studies that used the same methodology in different cities (New York City, NYC and Salt Lake City, UT). According to the findings of these three studies, the other urban design qualities including human scale, complexity, as well as enclosure, are not playing a significant role in walkability, despite the theoretical justification and the extensive operationalization efforts. The findings of this study draw policy makers' attention to creating more appealing and walkable places through the implementation of these urban design qualities.

#### **Record 45**

Title: Walkability and Resilience: A Qualitative Approach to Design for Risk Reduction

Author(s): Porebska, A (Porebska, Anna)[ 1 ] ; Rizzi, P (Rizzi, Paola)[ 2,3 ] ; Otsuki, S (Otsuki, Satoshi)[ 4 ] ; Shiotsuki, M (Shiotsuki, Masahiro)[ 5 ]

Source: SUSTAINABILITY Volume: 11 Issue: 10 Article Number: 2878 DOI: 10.3390/su11102878  
Published: MAY 2 2019 Document Type:Article

Abstract: Quality of life and well-being are hardly ever an issue when life itself is at stake. The advantages of high-quality walkable streets and public spaces are underestimated when larger problems need to be addressed first and seemingly more serious solutions need to be applied. Hence, a quantitative approach to evacuation route planning and design prevails over a qualitative one or at least a hybrid one. The scope of the ongoing study partially presented in this paper is to find methods for addressing the complicated present and the disastrous future at the same time. The one applied in the case study reported here Susaki City in Kchi Prefecture, Japan, which is preparing for the next Nankai earthquake and tsunami, expected sometime soon was a cycle of active research and international workshops organized in cooperation with the local community and administration. The aim was to understand the challenges that concern the design of dual spaces that are suitable for both everyday life and emergency situations and are connected by walkable spaces. As a result, the paper offers insight into the limits of punctual treatments as well as the relativity of objective and subjective dimensions of urban walkability in the context of risk. Despite the

complexity of the issue, a walkable built environment was revealed to be a countermeasure rather than a fad.

#### **Record 46**

Title: Walkable Environments and Healthy Urban Moves: Urban Context Features Assessment Framework Experienced in Milan

Author(s): Rebecchi, A (Rebecchi, Andrea)[ 1 ] ; Buffoli, M (Buffoli, Maddalena)[ 1 ] ; Dettori, M (Dettori, Marco)[ 2 ] ; Appolloni, L (Appolloni, Letizia)[ 3 ] ; Azara, A (Azara, Antonio)[ 2 ] ; Castiglia, P (Castiglia, Paolo)[ 2 ] ; D'Alessandro, D (D'Alessandro, Daniela)[ 3 ] ; Capolongo, S (Capolongo, Stefano)[ 1 ]

Source: SUSTAINABILITY Volume: 11 Issue: 10 Article Number: 2778 DOI: 10.3390/su11102778  
Published: MAY 2 2019 Document Type:Article

Abstract: Recent studies in public health have focused on determining the influences of the built environment on the population's physical and mental health status. In order to promote active transport and physical activity, considered favorable behavior for the prevention non-communicable diseases (NCDs) such as obesity, it is necessary to reduce the negative effects of the built environment and develop positive ones, such as, for example, a walkable urban space. The aim of the research is to define a city's walkability assessment framework capable of highlighting points of strength and weakness in its urban environment. All of the aspects that have a direct influence (evidence-based) on fostering the adoption of healthy lifestyles or promoting active transport as a strategy to increase the level of physical activity due to the existence of daily urban travel should be considered. After conducting a literature review aimed at identifying all of the existing assessment tools, 20 research studies were examined in detail. The new evaluation method arises from the comparison and critical selection of the various qualitative-quantitative indicators found, integrated into a multi-criteria analysis structure of dual-scale survey, with reference to walkability and paying attention to those indicators that have implications on health promotion. The new assessment framework, named Milano Walkability Measurement (MWM), is applicable in different urban contexts and was tested in two different areas of Milan. The Macro dimension (i.e., Density, Diversity, and Design criteria) refers to the urban scale and examines the city from a top view. It describes quantitatively the overall urban factors (urban area size equal to 1.5 Km<sup>2</sup>); typology of data: archival). The Micro dimension (i.e., Usefulness, Safeness, Comfort, and Aesthetics criteria) investigates the city at the street scale level. It describes qualitatively features of the outdoor spaces (road length of about 500/700 mt; typology of data: observational). Finally, the framework was weighted by comparison with a panel of experts. The expected results were reflected in the design recommendations based on the collected qualitative-quantitative data. The developed assessment method brings innovative criteria such as the multi-scaling assessment phase (Macro and Micro) and the ability to take into consideration aspects that according to the literature have relationships with health promotion linked to the improvement of a healthy lifestyle, related to daily active transportation choices. The design recommendations are useful both to policy-makers, to make evidence-based specific choices, and to designers, to understand what aspects of the urban environment must be improved or implemented in order to promote a walkable city.

#### **Record 47**

Title: Empirical Study on the Boundary Space Form of Residential Blocks Oriented Toward Low-Carbon Travel

Author(s): Zhou, Y (Zhou, Yang)[ 1 ] ; Ji, H (Ji, Hui)[ 1 ] ; Zhang, ST (Zhang, Songtian)[ 1 ] ; Qian, CY (Qian, Caiyun)[ 1 ] ; Wei, ZX (Wei, Zixiong)[ 1 ]

Source: SUSTAINABILITY Volume: 11 Issue: 10 Article Number: 2812 DOI: 10.3390/su11102812  
Published: MAY 2 2019 Document Type:Article

Abstract: As one of the three major carbon sources in cities, urban mobility has posed severe challenges to the social environment. Promoting low-carbon travel for residents is an important measure for building a low-carbon city and mitigating climate change. However, to date, previous research on residents' low-

carbon travel has been more oriented toward urban planning, while quantitative research on the influence of the boundary space form of residential blocks on residents' travel modes, which takes residential blocks as the research objects at the meso- and micro-level, is relatively rare. Residential blocks in China, which were built in the late 1990s, mostly have a large and gated spatial form. Individual residential blocks are often gated by fences, commercial buildings, and other forms of interfaces, forming an independent residential group. Long and closed boundary forms will have a certain impact on residents' choice of low-carbon travel modes, such as walking, riding bikes, and so on. Taking Nanjing as an example, this paper explores the essential factors that impact residents' travel behaviors from the perspective of the boundary space of residential blocks, combining the socio-economic attributes of residents, land use, and transit facilities, and there are four dimensions to the study, including the boundary block scale, types of boundary interface, density and distribution of accesses, and the slow-travel environment, proposing recommended values of the relevant indicators in a targeted manner. This paper selects 21 residential blocks in the main districts in Nanjing, conducting a related survey on the residents' socio-economic attributes and travel characteristics, boundary space form, land use, and transit facilities. The data obtained from the survey are analyzed by correlation analysis and multiple logistic regression analysis, so as to screen out the key variables of the boundary space forms of the blocks that affect residents' low-carbon travel. Meanwhile, on the basis of the appropriate share of low-carbon travel, the unary linear regression model is used to propose ideal recommended values of the key variables of the boundary space forms of the residential blocks. For instance, the block boundary density is recommended to be above 34.38 km/km<sup>2</sup>, the permeability coefficient of the block interface should be above 0.43, the commercial interface ratio should be above 18.16 km/km<sup>2</sup>, the density of accesses of the blocks is recommended to be above 246.71 km/km<sup>2</sup>, and the cross-sectional ratio of the slow-travel roads should be above 0.5.

#### **Record 48**

Title: What works best when implementing a physical activity intervention for teenagers? Reflections from the ACTIVE Project: a qualitative study

Author(s): James, M (James, Michaela)[ 1 ] ; Christian, D (Christian, Danielle)[ 2 ] ; Scott, S (Scott, Samantha)[ 1 ] ; Todd, C (Todd, Charlotte)[ 1 ] ; Stratton, G (Stratton, Gareth)[ 3 ] ; Demmler, J (Demmler, Joanne)[ 1 ] ; McCoubrey, S (McCoubrey, Sarah)[ 4 ] ; Halcox, J (Halcox, Julian)[ 1 ] ; Audrey, S (Audrey, Suzanne)[ 5 ] ; Ellins, EA (Ellins, Elizabeth A.)( [ 6 ] ; Irvine, E (Irvine, Elizabeth)[ 1 ] ; Brophy, S (Brophy, Sinead)[ 1 ]

Source: BMJ OPEN Volume: 9 Issue: 5 Article Number: e025618 DOI: 10.1136/bmjopen-2018-025618  
Published: MAY 2019 Document Type:Article

Abstract: Objective This paper explores what aspects of a multicomponent intervention were deemed strengths and weaknesses by teenagers and the local council when promoting physical activity to young people. Design Qualitative findings at 12 months from a mixed method randomised control trial. Methods Active Children Through Incentive Vouchers-Evaluation (ACTIVE) gave teenagers 20 pound of activity enabling vouchers every month for a year. Peer mentors were also trained and a support worker worked with teenagers to improve knowledge of what was available. Semistructured focus groups took place at 12 months to assess strengths and weaknesses of the intervention. Eight focus groups (n=64 participants) took place with teenagers and one additional focus group was dedicated to the local council's sport development team (n=8 participants). Thematic analysis was used to analyse the data. Results Teenagers used the vouchers on three main activities: trampolining, laser tag or the water park. These appeal to both genders, are social, fun and require no prior skill or training. Choice and financial support for teenagers in deprived areas was considered a strength by teenagers and the local council. Teenagers did not engage with a trained peer mentor but the support worker was considered helpful. Conclusions The ACTIVE Project's delivery had both strengths and weakness that could be used to underpin future physical activity promotion. Future interventions should focus on improving access to low cost, fun, unstructured and social activities rather than structured organised exercise/sport. The lessons learnt from this project can help bridge the gap between what is promoted to teenagers and what they actually want from activity provision.

#### **Record 49**

**Title:** Environmental correlates of sedentary time and physical activity in preschool children living in a relatively rural setting in the Netherlands: a cross-sectional analysis of the GECKO Drenthe cohort

**Author(s):** Lu, CC (Lu, Congchao)[ 1,2,3 ] ; Huang, GW (Huang, Guowei)[ 3,4 ] ; Corpeleijn, E (Corpeleijn, Eva)[ 1 ]

**Source:** BMJ OPEN Volume: 9 Issue: 5 Article Number: e027468 DOI: 10.1136/bmjopen-2018-027468  
Published: MAY 2019 Document Type:Article

**Abstract:** Objectives This study examined the relationship between environmental correlates and children's sedentary time (ST), light physical activity (LPA) and moderate-to-vigorous physical activity (MVPA) in preschool children. Design Cross-sectional study Setting A birth cohort in Drenthe, a northern province and relatively rural area of the Netherlands. Participants Valid data both for the ActiGraph and the questionnaire were obtained from 505 child-parent pairs. Primary and secondary outcome measures ST, LPA and MVPA of children were objectively measured by ActiGraph accelerometry (minimum three wearing days, more than 10 hours/day). Environmental correlates were collected using a questionnaire reported by parents that included household characteristics, parental and children's PA behaviours and neighbourhood environment (eg, traffic safety, road network and presence of PA facilities). Potential correlates were identified using linear regression analysis, adjusted by age, gender, siblings, and maternal age and education level. Ordinary least square regression-based path analysis was used to estimate direct and indirect effects on activity outcomes in mediation models. Results Linear regression analysis showed that 'parents taking children to play sports' was related to less ST, more LPA and MVPA; more outdoor play was also related to less ST and more LPA, but not MVPA. Parents who perceived more PA facilities in their neighbourhood showed more support for 'taking children to play sports', and this was associated with less ST or more MVPA compared with children living with less PA facilities in their neighbourhood. No evidence was found for a relation between traffic safety or road network with ST, LPA and MVPA. Conclusions This study indicated that parental support and child outdoor play may influence children's daily PA patterns. Convenient neighbourhood PA facilities, such as parks and playgrounds, had an indirect effect through parental support associated with lower children's ST and higher MVPA, even in relatively rural areas.

## Record 50

**Title:** Is neighbourhood social cohesion associated with subjective well-being for older Chinese people? The neighbourhood social cohesion study

**Author(s):** Yu, R (Yu, Ruby)[ 1,2 ] ; Cheung, O (Cheung, Osbert)[ 1 ] ; Leung, J (Leung, Jason)[ 3 ] ; Tong, C (Tong, Cecilia)[ 2 ] ; Lau, K (Lau, Kevin)[ 2,4 ] ; Cheung, J (Cheung, Johnny)[ 2 ] ; Woo, J (Woo, Jean)[ 1,2 ]

**Source:** BMJ OPEN Volume: 9 Issue: 5 Article Number: e023332 DOI: 10.1136/bmjopen-2018-023332  
Published: MAY 2019 Document Type:Article

**Abstract:** Objectives To evaluate the psychometric properties of the Hong Kong version of Neighbourhood Cohesion Instrument (HK-NCI) and examine whether neighbourhood social cohesion as measured using HK-NCI would be associated with evaluative, hedonic and eudaemonic wellbeing. Design A validation analysis followed by a cross-sectional analysis of a community-based survey. Setting Communities in two districts (Sha Tin and Tai Po) in Hong Kong. Participants 301 community-dwelling Chinese men and women aged 60 years and older normally residing in Sha Tin or Tai Po for not less than six consecutive months at the time of participation in the study were interviewed. Measurements Neighbourhood social cohesion was measured using the 15-item HK-NCI. The Social Cohesion Scale (SCS) and the Brief Sense of Community Scale (BSCS) were administered for assessing the validity of the HK-NCI. Evaluative (life satisfaction), hedonic (feelings of happiness) and eudaemonic well-being (sense of purpose and meaning in life) were examined. Socio-demographic characteristics, lifestyle and health behaviours, medical history, and neighbourhood characteristics were used as covariates. Results For homogeneity, internal consistency of HK-NCI ( $\alpha = 0.813$ ) was good. For stability (test-retest reliability), the averages of mean scores of the 15 items suggested an acceptable repeatability with an intra-class correlation coefficient = 0.701 (95% CI 0.497 to 0.832). HK-NCI was correlated with SCS ( $r = 0.515-0.635$ ,  $p < 0.001$ ) and BSCS ( $r = 0.500-0.612$ ,  $p < 0.001$ ).

Neighbourhood social cohesion was positively and independently associated with life satisfaction, feelings of happiness and sense of purpose and meaning in life (all p values <0.05). Stratified analyses indicated that neighbourhood social cohesion was more strongly associated with all dimensions of subjective wellbeing in 'young-old' subgroup, and with sense of purpose and meaning in life for women. Conclusion The HK-NCI has adequate levels of internal consistency and test-retest reliability. In addition, higher levels of neighbourhood social cohesion were associated with better subjective well-being among older Chinese people.

## Record 51

Title: Dog ownership, the natural outdoor environment and health: a cross-sectional study

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Source: BMJ OPEN Volume: 9 Issue: 5 Article Number: e023000 DOI: 10.1136/bmjopen-2018-023000  
Published: MAY 2019 Document Type:Article

Abstract: Objectives Dog owners walking their dog in natural outdoor environments (NOE) may benefit from the physical activity facilitated by dog walking and from time spent in nature. However, it is unclear whether dog owners receive additional health benefits associated with having access to NOE above the physical activity benefit of walking with their dog. We investigated associations between dog ownership, walking, time spent in NOE and health and whether these associations differed among those with good and poor access to NOE and those living in green and less green areas. Design Cross-sectional study. Setting The Positive Health Effects of the Natural Outdoor Environment in Typical Populations in Different Regions in Europe project. Participants n=3586 adults from Barcelona (Spain), Doetinchem (the Netherlands), Kaunas (Lithuania) and Stoke-on-Trent (UK). Data collection and analysis We calculated access to NOE with land maps and residential surrounding greenness with satellite data. Leisure time walking, time spent in NOE and general and mental health status were measured using validated questionnaires. Associations were estimated using multilevel analysis with a random intercept defined at the neighbourhood level. Results Dog ownership was associated with higher rates of leisure time walking and time spending in NOE (OR 2.17, 95% CI 1.86 to 2.54 and 2.37, 95% CI 2.02 to 2.79, respectively). These associations were stronger in those living within 300 m of a NOE and in greener areas. No consistent associations were found between dog ownership and perceived general or mental health status. Conclusions Compared with non-dog owners, dog owners walked more and spent more time in NOE, especially those living within 300 m of a NOE and in greener areas. The health implications of these relationships should be further investigated. In a largely physically inactive society, dog walking in NOE may be a simple way of promoting physical activity and health.

## Record 52

Title: Developing a pedestrian destination choice model using the stratified importance sampling method

Author(s): Berjisian, E (Berjisian, Elmira)[ 1 ] ; Habibian, M (Habibian, Meeghat)[ 1 ]

Source: JOURNAL OF TRANSPORT GEOGRAPHY Volume: 77 Pages: 39-47 DOI: 10.1016/j.jtrangeo.2019.04.009 Published: MAY 2019 Document Type:Article

Abstract: Pedestrian destination choice models are among the issues that have not been adequately addressed by transportation researchers. Several issues should be considered in order to develop a pedestrian destination choice model, including the method used to generate destination choice sets as well as the specification of different environmental variables that influence walking. Although some studies use built environment variables to elaborate on pedestrian destination choice models, almost all of them neglect the importance of the choice set generation method and rely merely on the random sampling method. This

study illustrates the extent to which a choice set generation method can influence the parameter estimates of a pedestrian destination choice model. Here, in addition to the random sampling method, the method of stratified importance sampling is addressed to develop a pedestrian destination choice model for the city of Rasht, Iran. In addition, an exhaustive array of built environment variables that are known to have a significant effect on walking is employed. The results suggest that using stratified random sampling can improve the destination choice model in both goodness of fit and percent correct of the prediction of pedestrians' destination. The relative importance of environmental variables with respect to altering the pedestrians' destination choices is demonstrated through their elasticities' values. Two scenarios, which aim to improve the walking environment by enhancing network connectivity, are examined. As a result, the pedestrian catchment area is suggested to be the most effective variable of network connectivity. The results of these scenarios can assist policy makers to identify zones that deserve more attention.

### **Record 53**

Title: Does new bicycle infrastructure result in new or rerouted bicyclists? A longitudinal GPS study in Oslo

Author(s): Pritchard, R (Pritchard, Ray)[ 1 ] ; Bucher, D (Bucher, Dominik)[ 2 ] ; Froyen, Y (Froyen, Yngve)[ 1 ]

Source: JOURNAL OF TRANSPORT GEOGRAPHY Volume: 77 Pages: 113-125 DOI: 10.1016/j.jtrangeo.2019.05.005 Published: MAY 2019 Document Type:Article

Abstract: Well-connected bicycle infrastructure networks are widely accepted to be an important factor for increasing the level of bicycling in urban environments where motorised and active transport modes must co-exist. However, little is known about the extent to which new bicycle infrastructure results in changes of route amongst existing bicyclists as opposed to changes in the mode of transport. This article addresses the route-mode research gap through a panel study in which participant travel behaviour (n = 113) is recorded with a smartphone Global Positioning System (GPS) application. The study observes short-term changes to route and mode choice of participants before and after the establishment of a contraflow bicycle lane in Oslo, Norway. Video and radar based traffic counting are used as supplementary methods to affirm bicycle volume changes in the broader population. The bicycle lane intervention resulted in a shift in the preferred route in the neighbourhood. The intervention street saw increased numbers of bicycle trips taken whilst the two nearest parallel routes in the same neighbourhood witnessed a decrease. For bicycle trips taken on the intervention street, the mean deviation from the shortest path increased (from 171 to 221 m, p <.05). Bicycle counts based on video observations also support the route shift finding. Bicycle modal share did not significantly increase when comparing the panel sub-group exposed to the intervention (n = 39) with a quasi-control group (n = 47) who were not exposed but had made at least one trip in the near vicinity of the intervention in both time periods. This natural experiment study provides evidence to suggest that route substitution from nearby streets and paths can explain more of the change in bicycling levels than modal shifts to bicycling in the short term following the opening of the bike lane.

### **Record 54**

Title: Reducing Inequities in Early Childhood Mental Health: How Might the Neighborhood Built Environment Help Close the Gap? A Systematic Search and Critical Review

Author(s): Alderton, A (Alderton, Amanda)[ 1,2 ] ; Villanueva, K (Villanueva, Karen)[ 1,2 ] ; O'Connor, M (O'Connor, Meredith)[ 2,3,4 ] ; Boulange, C (Boulange, Claire)[ 1 ] ; Badland, H (Badland, Hannah)[ 1 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH Volume: 16 Issue: 9 Article Number: 1516 DOI: 10.3390/ijerph16091516 Published: MAY 1 2019 Document Type:Review

Abstract: Background: Optimal mental health in early childhood is key to later mental health, physical health, education, and social outcomes; yet, children facing disadvantage tend to have worse mental health and fewer opportunities to develop this foundation. An emerging body of research shows that neighborhoods provide important opportunities for the development of children's mental health.

Synthesizing this evidence can advance understandings of the features of the neighborhood built environment (e.g., housing, parks) that (1) promote optimal mental health in childhood and (2) reduce mental health inequities. Methods: We systematically searched and critically reviewed the international quantitative literature investigating associations between the neighborhood built environment and young children's mental health. Results: 14 articles met inclusion criteria; most examined nature or public open space. Studies tended to find greater access to or quantity of neighborhood nature or public open space were associated with better mental health. Significant gaps included a lack of studies investigating social infrastructure, and few studies examined how the built environment related to positive mental health (i.e., functioning, rather than problems). Conclusions: Current evidence suggests there is some relationship, but additional research is needed that addresses these gaps and examines differences in associations between child subgroups (e.g., diverse socioeconomic backgrounds).

#### **Record 55**

Title: Public Transportation Environment and Medical Choice for Chronic Disease: A Case Study of Gaoyou, China

Author(s): Cao, Y (Cao, Yang)[ 1 ] ; Zhen, F (Zhen, Feng)[ 1 ] ; Wu, H (Wu, Hao)[ 2 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 9 Article Number: 1612 DOI: 10.3390/ijerph16091612 Published: MAY 1 2019 Document Type:Article

Abstract: Current research on the built environment and medical choice focuses mainly on the construction and optimization of medical service systems from the perspective of supply. There is a lack of in-depth research on medical choice from the perspective of patient demand. Based on the medical choice behaviour of patients with chronic diseases, this article identifies the spatial distribution and heterogeneity characteristics of medical choice and evaluates the balance between medical supply and demand in each block. On this basis, we explored the mechanism of patient preferences for different levels of medical facilities by considering the patient's socioeconomic background, medical resource evaluation, and other built environment features of the neighbourhood by referring to patient questionnaires. In addition to socioeconomic characteristics, the results show that public transportation convenience, medical accessibility, and medical institution conditions also have significant influences on patient preferences, and the impact on low-income patients is more remarkable. The conclusions of the study provide a reference for the promotion and optimization of the functions of urban medical resources and the guidance of relevant public health policies.

#### **Record 56**

Title: Examining the Features of Parks That Children Visit During Three Stages of Childhood

Author(s): Flowers, EP (Flowers, Elliott P.)[ 1 ] ; Timperio, A (Timperio, Anna)[ 1 ] ; Hesketh, KD (Hesketh, Kylie D.)[ 1 ] ; Veitch, J (Veitch, Jenny)[ 1 ]

Source: JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH Volume: 16 Issue: 9 Article Number: 1658 DOI: 10.3390/ijerph16091658 Published: MAY 1 2019 Document Type:Article

Abstract: Parks provide an opportunity for children to be physically active, but are rarely fully utilised. A better understanding of which park features attract children of varying ages is needed. This study examined which features are present at parks that children visit most often at different stages throughout childhood. Parents reported the park their child visited most often at three timepoints: T1 = 3-5 years, T2 = 6-8 years, and T3 = 9-11 years. These parks were then audited (using a purposely created audit tool) to capture information relating to access, activity areas and quality. Online mapping tools were also used to determine walking distance to parks and park size. Parks visited at T2 were further from home, larger, and had more road crossings, full courts, other facilities and comfort amenities such as toilets and lights than T1 parks. Parks visited at T3 were larger and had more sports ovals compared to T1 parks, and were significantly less likely to have barbeque facilities than T2 parks. Our findings suggest that as children transition from

pre-school (T1), to primary school age (T2 and T3), they visit parks that have more facilities to support sport and active recreation.

#### **Record 57**

Title: The Relationships between Adolescents' Obesity and the Built Environment: Are They City Dependent?

Author(s): HaGani, N (HaGani, Neta)[ 1 ] ; Moran, MR (Moran, Mika R.)[ 1 ] ; Caspi, O (Caspi, Or)[ 2 ] ; Plaut, P (Plaut, Pnina)[ 2 ] ; Endevelt, R (Endevelt, Ronit)[ 1 ] ; Baron-Epel, O (Baron-Epel, Orna)[ 1 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 9 Article Number: 1579 DOI: 10.3390/ijerph16091579 Published: MAY 1 2019 Document Type:Article

Abstract: There is evidence that the built environment can promote unhealthy habits which may increase the risk for obesity among adolescents. However, the majority of evidence is from North America, Europe and Australia, and less is known about other world regions. The purpose of this study was to examine how the number of overweight and obese adolescents may vary in relation to the built environment, area socioeconomic status (SES), physical activity (PA) and nutritional home environment. We performed a telephone survey of 904 adolescents ages 15-18 from three different cities in Israel. The questionnaire included: reported PA, sedentary behaviors and nutritional home environment. Body Mass Index (BMI) was attained from records of Maccabi Healthcare Services (MHS). The built environment measures were calculated by Geographic Information System (GIS). Multivariable logistic regression analysis was performed to identify variables associated with adolescents' overweight and obesity. The highest level of overweight and obese adolescents was in Beer Sheva (29.2%). The three cities did not differ in built environment characteristics, PA and sedentary behaviors. In Haifa, a more positive nutritional home environment was reported ( $p = 0.001$ ). Boys, in all three cities presented higher rates of overweight and obesity (29%). After adjusting for covariates, adolescents' overweight and obesity was associated with built environment measures only in a low SES peripheral city (OR = 0.72; 95% CI: 0.56-0.92), and positively associated with higher level of sedentary behavior in the total sample (OR = 1.23; 95% CI:1.03-1.47). This may imply a much more complex causal pathway between the built environment, SES and obesity than suggested in previous literature.

#### **Record 58**

Title: How Do Neighbourhood Definitions Influence the Associations between Built Environment and Physical Activity?

Author(s): Mavoa, S (Mavoa, Suzanne)[ 1,2,3 ] ; Bagheri, N (Bagheri, Nasser)[ 4 ] ; Koohsari, MJ (Koohsari, Mohammad Javad)[ 5,6 ] ; Kaczynski, AT (Kaczynski, Andrew T.)[ 7 ] ; Lamb, KE (Lamb, Karen E.)[ 8 ] ; Oka, K (Oka, Koichiro)[ 5 ] ; O'Sullivan, D (O'Sullivan, David)[ 9 ] ; Witten, K (Witten, Karen)[ 1,2 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 9 Article Number: 1501 DOI: 10.3390/ijerph16091501 Published: MAY 1 2019 Document Type:Article

Abstract: Researchers investigating relationships between the neighbourhood environment and health first need to decide on the spatial extent of the neighbourhood they are interested in. This decision is an important and ongoing methodological challenge since different methods of defining and delineating neighbourhood boundaries can produce different results. This paper explores this issue in the context of a New Zealand-based study of the relationship between the built environment and multiple measures of physical activity. Geographic information systems were used to measure three built environment attributes-dwelling density, street connectivity, and neighbourhood destination accessibility-using seven different neighbourhood definitions (three administrative unit boundaries, and 500, 800, 1000- and 1500-m road network buffers). The associations between the three built environment measures and five measures of physical activity (mean accelerometer counts per hour, percentage time in moderate-vigorous physical

activity, self-reported walking for transport, self-reported walking for recreation and self-reported walking for all purposes) were modelled for each neighbourhood definition. The combination of the choice of neighbourhood definition, built environment measure, and physical activity measure determined whether evidence of an association was detected or not. Results demonstrated that, while there was no single ideal neighbourhood definition, the built environment was most consistently associated with a range of physical activity measures when the 800-m and 1000-m road network buffers were used. For the street connectivity and destination accessibility measures, associations with physical activity were less likely to be detected at smaller scales (less than 800 m). In line with some previous research, this study demonstrated that the choice of neighbourhood definition can influence whether or not an association between the built environment and adults' physical activity is detected or not. This study additionally highlighted the importance of the choice of built environment attribute and physical activity measures. While we identified the 800-m and 1000-m road network buffers as the neighbourhood definitions most consistently associated with a range of physical activity measures, it is important that researchers carefully consider the most appropriate type of neighbourhood definition and scale for the particular aim and participants, especially at smaller scales.

### **Record 59**

Title: Influence of Urban Green Space and Facility Accessibility on Exercise and Healthy Diet in Hong Kong

Author(s): Yuen, JWM (Yuen, John W. M.)[ 1 ] ; Chang, KKP (Chang, Katherine K. P.)[ 1 ] ; Wong, FKY (Wong, Frances K. Y.)[ 1 ] ; Wong, FY (Wong, Fiona Y.)[ 2 ] ; Siu, JYM (Siu, Judy Y. M.)[ 3 ] ; Ho, HC (Ho, H. C.)[ 4 ] ; Wong, MS (Wong, M. S.)[ 5 ] ; Ho, JYS (Ho, Janice Y. S.)[ 1 ] ; Chan, KL (Chan, K. L.)[ 1 ] ; Yang, L (Yang, Lin)[ 1 ]

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH  
Volume: 16 Issue: 9 Article Number: 1514 DOI: 10.3390/ijerph16091514 Published: MAY 1 2019 Document Type:Article

Abstract: Background A cross-sectional study using a convenience sampling method was conducted to understand how green space and accessibility of common public open spaces in compact urban areas affect physical activity and healthy diets of residents. Methods A total of 554 residents completed a structured questionnaire on quality of life, physical activity level and healthy eating practice. Particularly, categories of physical activity and durations were obtained by using the short form Chinese International Physical Activity Questionnaire (IPAQ-C), then the Metabolic Equivalent of Task (MET)-minutes/week was calculated using the formulae (walking minutes x walking days x 3.3) + (moderate-intensity activity minutes x moderate days x 4.0) + (vigorous-intensity activity minutes x vigorous-intensity days x 8.0). The percentage of green space was calculated based on a spatial buffer with a 500 m radius from participants' geocoded addresses using a SPOT ('Satellite Pour l'Observation de la Terre' in French) satellite image-derived vegetation dataset. Parks, promenade and sports facilities were examples of open spaces. Results The sampled population who lived with green space averaged 10.11% +/- 7.95% (ranged 1.56-32.90%), with the majority (90%) performing physical activities at medium and high levels. MET-minutes/week was significantly associated (Pearson  $r = 0.092$ ;  $p < 0.05$ ) with the green space percentage. Relatively active residents commonly used open spaces within the district for performing exercise, in particular, parks and promenades were mostly used by older residents, while sports facilities by the younger groups at age 25-44 and <25 years. Conclusions Current findings suggested promotion of exercise could be achieved by the design or redesign of built environment to include more parks accessible to the residents with the increase of vegetation.

### **Record 60**

Title: Loneliness and Neighborhood Characteristics: A Multi-Informant, Nationally Representative Study of Young Adults

Author(s): Matthews, T (Matthews, Timothy)[ 1 ] ; Odgers, CL (Odgers, Candice L.)[ 2,3 ] ; Danese, A (Danese, Andrea)[ 1,4 ] ; Fisher, HL (Fisher, Helen L.)[ 1 ] ; Newbury, JB (Newbury, Joanne B.)[ 1 ] ; Caspi,

A (Caspi, Avshalom)[ 1,5,6,7 ] ; Moffitt, TE (Moffitt, Terrie E.)[ 1,5,6,7 ] ; Arseneault, L (Arseneault, Louise)[ 1 ]

Source: PSYCHOLOGICAL SCIENCE Volume: 30 Issue: 5 Pages: 765-775 DOI: 10.1177/0956797619836102 Published: MAY 2019 Document Type:Article

Abstract: In this study, we investigated associations between the characteristics of the neighborhoods in which young adults live and their feelings of loneliness, using data from different sources. Participants were drawn from the Environmental Risk Longitudinal Twin Study. Loneliness was measured via self-reports at ages 12 and 18 years and also by interviewer ratings at age 18. Neighborhood characteristics were assessed between the ages of 12 and 18 via government data, systematic social observations, a resident survey, and participants' self-reports. Greater loneliness was associated with perceptions of lower collective efficacy and greater neighborhood disorder but not with more objective measures of neighborhood characteristics. Lonelier individuals perceived the collective efficacy of their neighborhoods to be lower than did their less lonely siblings who lived at the same address. These findings suggest that feelings of loneliness are associated with negatively biased perceptions of neighborhood characteristics, which may have implications for lonely individuals' likelihood of escaping loneliness.

#### **Record 61**

Title: Social Determinants of Human Papillomavirus Vaccine Uptake: An Assessment of Publicly Available Data

Author(s): Maness, SB (Maness, Sarah B.)[ 1 ] ; Thompson, EL (Thompson, Erika L.)[ 2 ]

Source: PUBLIC HEALTH REPORTS Volume: 134 Issue: 3 Pages: 264-273 DOI: 10.1177/0033354919838219 Published: MAY-JUN 2019 Document Type:Article

Abstract: Objectives: Despite cancer prevention benefits associated with the human papillomavirus (HPV) vaccine, uptake in the United States is relatively low among males and females. Our objective was to use the Healthy People 2020 social determinants of health framework to determine the availability and characteristics of data on economic, educational, social, health care, and community factors affecting HPV vaccine uptake in the United States. Methods: We included the most recent data sets from 6 publicly available, US-based, federally funded surveys that contained at least 1 measure of HPV vaccination among adolescents and young adults. We searched each data set for any social determinants of health measures within the 5 domains of the framework: economic stability, education, social and community context, health and health care, and neighborhood and built environment. Results: The social determinants of health domains of education, economic stability, and health and health care appeared in all data sets. The domains of social and community context and neighborhood and built environment appeared in only 3 data sets. Even when domains were represented, we discovered gaps in the data sets, in which only limited measures of the social determinants were available. Conclusion: The addition of questions about the social determinants of health to the surveys that generate these data sets, particularly in the domains of social and community context and neighborhood and built environment, would strengthen the ability of public health researchers, policy makers, and professionals to identify associations between the social determinants of health and HPV vaccine uptake.

#### **Record 62**

Title: Cycling or walking? Determinants of mode choice in the Netherlands

Author(s): Ton, D (Ton, Danique)[ 1 ] ; Duives, DC (Duives, Dorine C.)[ 1 ] ; Cats, O (Cats, Oded)[ 1 ] ; Hoogendoorn-Lanser, S (Hoogendoorn-Lanser, Sascha)[ 2 ] ; Hoogendoorn, SP (Hoogendoorn, Serge P.)[ 1 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 7-23 Special Issue: SI DOI: 10.1016/j.tra.2018.08.023 Published: MAY 2019 Document Type:Article

**Abstract:** Interest into active modes (i.e. walking and cycling) has increased significantly over the past decades, with governments worldwide ultimately aiming for a modal shift towards active modes. To devise policies that promote this goal, understanding the determinants that influence the choice for an active mode is essential. The Netherlands is country with a large and demographically diverse active mode user population, mature and complete active mode infrastructure, and safe environment. Mode choice research from the Netherlands enables a comparison on relevant determinants with countries that have a low active mode share. Furthermore, it can provide quantitative input for policies aiming at an active mode shift. This paper estimates a mode choice model focusing on active modes, while including a more comprehensive set of modes (i.e. walking, cycling, public transport and car). Based on data from the Netherlands Mobility Panel (MPN) in combination with an additional survey focused on active modes (coined PAW-AM), this study estimates which determinants influence mode choice. The determinants can be categorized as individual characteristics, household characteristics, season and weather characteristics, trip characteristics, built environment, and work conditions. The results show that all categories of determinants influence both walking and cycling. However, the choice for cycling or walking is affected by different determinants and to a different extent. In addition, no active mode nest was found in the model estimation. Cycling and walking should thus be regarded as two distinguished alternatives. Furthermore, the results show that active mode use is most sensitive to changes in the trip characteristics and the built environment.

### **Record 63**

**Title:** The relation of the road environment and bicycling attitudes to usual travel mode to school in teenagers

**Author(s):** Fitch, DT (Fitch, Dillon T.)[ 1 ] ; Rhemtulla, M (Rhemtulla, Mijke)[ 2 ] ; Handy, SL (Handy, Susan L.)[ 3,4 ]

**Source:** TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 35-53 Special Issue: SI DOI: 10.1016/j.tra.2018.06.013 Published: MAY 2019 Document Type:Article

**Abstract:** Although active travel to school for primary school students has been widely studied, research into the determinants of teenage active travel to school is noticeably lacking. Understanding the determinants of teen active travel to school is important given that teenage travel may have implications for the formation of habits that carry over to adulthood. We present evidence linking travel to school with bicycling attitudes and with road environments on plausible paths to school using data from a large cross-sectional survey of students at three high schools in Northern California. Results suggest that the relationship between attitudes and bicycling are stronger than the relationship between road environments and bicycling. Students' perceived social pressure to bicycle has a particularly strong association with bicycling. Hypothetical intervention scenarios suggest that students would walk and bicycle to school at substantially greater rates if they had better road environments for walking and bicycling, shorter distances to school, and more positive bicycling attitudes.

### **Record 64**

**Title:** Active travel as stable source of physical activity for one third of German adults: Evidence from longitudinal data

**Author(s):** Buehler, R (Buehler, Ralph)[ 1 ] ; Kuhnimhof, T (Kuhnimhof, Tobias)[ 2 ] ; Bauman, A (Bauman, Adrian)[ 3 ] ; Eisenmann, C (Eisenmann, Christine)[ 2 ]

**Source:** TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 105-118 Special Issue: SI DOI: 10.1016/j.tra.2018.09.022 Published: MAY 2019 Document Type:Article

**Abstract:** Walking and cycling-active travel-can help adults achieve the World Health Organization's recommended 150 + min of moderate-intensity aerobic physical activity per week. Based on a nationally representative panel-survey of daily travel in Germany, this study assesses weekly minutes of active travel by adult respondents participating in a weeklong survey in two consecutive years. The paper first identifies person-level covariates for achieving 150 + min of active travel during a week in year 1 of panel

participation. The analysis then compares the patterns of individuals falling into four groups of active travel over the two survey years: 'high maintainers' who achieved 150 + min in both year 1 and year 2; 'low maintainers' who did not achieve 150 + min in neither year 1 nor year 2; 'adopters' who did not achieve 150 + min in year 1, but did so in year 2; and 'relapsers' who achieved 150 + min in year 1, but not in year 2. About half (48%) of respondents achieved 150 + min of active travel per week in their first year of panel participation. Of those, about three-quarters were 'high maintainers' with 150 + min of active travel in both years. Logistic regressions showed that 'high maintainers' were more likely to be 30 years or older, not employed, have a monthly public transport pass, live within 2 km of a shopping destination, and less likely to own cars. Transport and land-use policies can help influence several of these factors. Compared to 'low maintainers,' policy interventions to increase population shares achieving health-enhancing levels of physical activity from active travel may be most promising when targeting 'adopters' and 'relapsers.' These groups are more similar to the 'high maintainers,' with at least one year reporting of health-enhancing physical activity from active travel-compared to the 'low maintainers.'

### **Record 65**

Title: Neighbourhood perceptions and older adults' wellbeing: Does walking explain the relationship in deprived urban communities?

Author(s): Curl, A (Curl, Angela)[ 1 ] ; Mason, P (Mason, Phil)[ 2 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 119-129 Special Issue: SI DOI: 10.1016/j.tra.2018.11.008 Published: MAY 2019 Document Type:Article

Abstract: There is increased awareness of the role of the urban landscape in promoting walking to counter the negative health and wellbeing impacts of age-related immobility. Consideration of neighbourhood design is particularly relevant in the context of local urban regeneration projects, which are designed to have positive health and wellbeing outcomes. However, few studies explicitly investigate how the environment influences walking and wellbeing for older adults living in deprived urban areas. There are strong conceptual and empirical links between walking, the urban environment and mental wellbeing. Many studies have separately demonstrated pairwise associations between all three components. In this paper we address these three concepts empirically, using structural equation modelling to explore walking as a mediator between the perceived social and built environments and mental wellbeing for older adults in deprived urban areas. We found direct and indirect relationships between neighbourhood perceptions and wellbeing. Walking partially mediates relationships between social contact, neighbourhood quality, local amenity use, safety and mental wellbeing. Although neighbourhood problems and the quality of local services and amenities are associated with mental wellbeing, walking is not an explanatory pathway in our model. The relationship between walking and wellbeing is weaker than expected. While promoting walking as a means of achieving positive mental wellbeing among older adults is important for "active ageing", it is also necessary to consider the context in which this takes place, recognising that walking is not the only potential causal pathway between environment and wellbeing. Where walking is relied upon for transport, the wellbeing implications may be more complex. Given the strong associations between car ownership and wellbeing, future research should explore whether mobility and accessibility, rather than walking itself, is more important for older adults' wellbeing.

### **Record 66**

Title: Impacts of an active travel intervention with a cycling focus in a suburban context: One-year findings from an evaluation of London's in-progress mini-Hollands programme

Author(s): Aldred, R (Aldred, Rachel)[ 1 ] ; Croft, J (Croft, Joseph)[ 1 ] ; Goodman, A (Goodman, Anna)[ 2 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 147-169 Special Issue: SI DOI: 10.1016/j.tra.2018.05.018 Published: MAY 2019 Document Type:Article

Abstract: Background: More evidence is needed on the impacts of building infrastructure for walking and cycling. A knowledge gap and an implementation gap have been mutually reinforcing. This paper reports

on a longitudinal study examining the impacts of the still in progress 'mini-Hollands programme', which seeks to transform local environments for walking and cycling, in three Outer London boroughs. Compared to Inner London, Outer London has low levels of cycling and low levels of walking, and is relatively car dependent. Methods: We conducted a longitudinal study of 1712 individuals sampled from households in mini-Holland boroughs (intervention sample) and from non mini-Holland Outer London boroughs (control sample). The intervention sample was further divided, a priori, into those living in "high-dose neighbourhoods", where substantial changes to the local walking and cycling infrastructure had been implemented, versus "low-dose neighbourhoods" where such improvements had not (yet) been made. At both baseline (2016) and one-year follow-up (2017), we administered an online survey of travel behaviour and attitudes to transport and the local environment. Results: One year's worth of interventions was associated with an increase in active travel among those living in areas defined as 'high-dose' neighbourhoods. Specifically, those in high-dose areas were 24% more likely to have done any past-week cycling at follow-up, compared to those living in non mini-Holland areas (95% CI, 2% to 52%). The mid-point estimate for increase in active travel (walking plus cycling) time for the same group was an additional 41.0 min (95% CI 7.0, 75.0 min). Positive changes in views about local environments were recorded in intervention areas, driven by a perceived improvement in cycling-related items. Controversy related to the interventions is expressed in a growth in perceptions that 'too much' money is spent on cycling in intervention areas. However, intervention areas also saw a reduction in perceptions that 'too little' money is spent (the latter view being common both at baseline and Wave 1 in control areas). Conclusion: Overall, the findings here suggest that programme interventions, while controversial, are having a measurable and early impact on active travel behaviour and perceptions of the local cycling environment.

#### **Record 67**

Title: Affective experiences of built environments and the promotion of urban walking

Author(s): Bornioli, A (Bornioli, Anna)[ 1,3 ] ; Parkhurst, G (Parkhurst, Graham)[ 1 ] ; Morgan, PL (Morgan, Phillip L.)[ 2,4 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 200-215 Special Issue: SI DOI: 10.1016/j.tr.2018.12.006 Published: MAY 2019 Document Type:Article

Abstract: According to psychological theories of environmental affect, the physical environment moderates the walking experience and its psychological wellbeing benefits. The present paper further demonstrates that affective experiences also influence intentions to walk. A study to explore the influence of affective experiences of walking on walking intentions is reported. A sample of adults working or studying in Bristol, UK (n = 384) participated in an experiment involving virtual exposure to one of five environments, with evaluations of their affective experience and of intentions to walk in the setting. A subsample (n = 14) then took part in photo-elicited semi structured interviews. Multiple regression analyses showed that affective experiences of walking influenced walking intentions. Interview analyses highlighted the role of traffic, city busyness, and poor aesthetics. This is the first empirical study that examines the walking experience and related walking intentions from the pedestrian perspective employing theories of environmental affect. The findings indicate that safety, comfort, and moderate sensory stimulation are crucial elements for the walking experience. Following this, a strategy to promote active mobility in the built environment can be constructed around safety, comfort, and moderate sensory stimulation by targeting the micro elements that prevent them.

#### **Record 68**

Title: Associations between individual characteristics, availability of bicycle infrastructure, and city-wide safety perceptions of bicycling: A cross-sectional survey of bicyclists in 6 Canadian and US cities

Author(s): Branion-Calles, M (Branion-Calles, Michael)[ 1,2 ] ; Nelson, T (Nelson, Trisalyn)[ 3 ] ; Fuller, D (Fuller, Daniel)[ 4,5 ] ; Gauyin, L (Gauyin, Lise)[ 6,7 ] ; Winters, M (Winters, Meghan)[ 1,2 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 229-239 Special Issue: SI DOI: 10.1016/j.tr.2018.10.024 Published: MAY 2019 Document Type:Article

**Abstract:** Safety concerns are a primary deterrent to bicycling. Bicycle infrastructure is both preferred and safer for bicycling. In this paper, we examine the association between availability of bicycle infrastructure and perceptions of bicycling safety amongst over 3000 bicyclists living in six large Canadian and US cities. In three repeat cross-sectional surveys (2012, 2013 and 2014), adults living in Boston, Chicago, New York, Montreal, Toronto, and Vancouver were surveyed about their bicycling habits, safety perceptions, and demographic characteristics as part of the International Bikeshare Impacts on Cycling and Collisions Study (n = 16,864). Participants were assigned a measure for the availability of bicycle infrastructure (a component of Bike Score called Bike Lane Score, range 0-100) based on their residential postal code. We used weighted multinomial regression models to examine associations between perceived bicycling safety and the availability of bicycle infrastructure, accounting for sociodemographic characteristics, amongst those who report bicycling in the past month (n = 3446; weighted n = 3493). Overall, 57.9% perceived bicycling in their city as safe, 15.1% as neutral, and 27.0% as dangerous. Our model indicates that, within cities, bicyclists with greater bicycle infrastructure availability had improved odds of perceiving bicycling as safe. Specifically, a 10-unit increase in Bike Lane Score was associated with 6% higher odds of a bicyclist perceiving the safety of bicycling as safe compared to neutral. Bicyclists who are male, younger, lower income, have young children, have a high-school education, and bicycle more frequently are predicted to be more likely to perceive bicycling in their city to be safe. These results suggest that increasing the availability of bicycle facilities by expanding bicycling networks may result in increases in perceptions of bicycling safety for existing bicyclists, but also that individual characteristics play a substantial role in bicycling safety perceptions.

## Record 69

**Title:** Where does active travel fit within local community narratives of mobility space and place?

**Author(s):** Biehl, A (Biehl, Alec)[ 1 ] ; Chen, Y (Chen, Ying)[ 1,2 ] ; Sanabria-Veaz, K (Sanabria-Veaz, Karla)[ 3 ] ; Uttal, D (Uttal, David)[ 4,5 ] ; Stathopoulos, A (Stathopoulos, Amanda)[ 1 ]

**Source:** TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 269-287 Special Issue: SI DOI: 10.1016/j.tra.2018.10.023 Published: MAY 2019 Document Type:Article

**Abstract:** Encouraging sustainable mobility patterns is at the forefront of policymaking at all scales of governance as the collective consciousness surrounding climate change continues to expand. Not every community, however, possesses the necessary economic or socio-cultural capital to encourage modal shifts away from private motorized vehicles towards active modes. The current literature on 'soft' policy emphasizes the importance of tailoring behavior change campaigns to individual or geographic context. Yet, there is a lack of insight and appropriate tools to promote active mobility and overcome transport disadvantage from the local community perspective. The current study investigates the promotion of walking and cycling adoption using a series of focus groups with local residents in two geographic communities, namely Chicago's (1) Humboldt Park neighborhood and (2) suburb of Evanston. The research centers on analysis of the verbal transcripts. The approach combines traditional qualitative discourse analysis with quantitative text mining tools, namely topic modeling and sentiment analysis. The aim of the analysis is to uncover the local mobility culture, embedded norms and values associated with acceptance of active travel modes in different communities. The analysis uncovers that underserved populations within diverse communities view active mobility simultaneously as a necessity and as a symbol of privilege that is sometimes at odds with the local culture. Thereby, this research expands on the walking and cycling literature by providing novel insights regarding the perceived benefits of, and barriers to, equitable promotion of these modes. The mixed methods approach to analyzing community member discourses is translated into policy findings that are either tailored to local context or broadly applicable to curbing automobile dominance. Overall, residents of both Humboldt Park and Evanston envision a society in which multimodalism replaces car -centrism, but differences in the local physical and social environments would and should influence the manner in which overarching policy objectives are met.

## Record 70

**Title:** Increasing cycling for transportation in Canadian communities: Understanding what works

Author(s): Assuncao-Denis, ME (Assuncao-Denis, Marie-Eve)[ 1 ] ; Tomalty, R (Tomalty, Ray)[ 1 ]

Source: TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE Volume: 123 Pages: 288-304 Special Issue: SI DOI: 10.1016/j.tra.2018.11.010 Published: MAY 2019 Document Type:Article

Abstract: This article looks at the different factors that contributed to an increase in utilitarian cycling between 1996 and 2015 in ten communities of various sizes and locations across Canada. Interviews with engineers, planners, activists, politicians and academics were conducted to assess which factors were more important in changing cycling practice in ten case studies areas that witnessed very large increases in their cycling commuting mode shares between the censuses of 1996 and 2011. The results show that although the story varies from case to case, some factors had more impact on cycling behaviour than others. Factors beyond the control of local actors, such as cultural, demographic and economic changes, have contributed significantly to an increase in utilitarian cycling in all case studies. In addition to these macro-trends, locally adopted measures have also been effective: the development of pro-cycling policies and programs, as well as the expansion of cycling infrastructure, seem to have heavily influenced cycling in several communities. In some case study areas, the activities and advocacy of cycling groups have been very influential. In a few cases, such as two small mountain communities, a specific event triggered the increase in cycling in the area. More often, however, it was a combination of government-controlled factors and larger macro-trends that created an environment favourable to cycling for transportation in the studied municipalities.

#### **Record 71**

Title: Neighborhood, social cohesion, and the Elderly's depression in Shanghai

Author(s): Miao, J (Miao, Jia)[ 1 ] ; Wu, XG (Wu, Xiaogang)[ 1,2 ] ; Sun, XL (Sun, Xiulin)[ 2 ]

Source: SOCIAL SCIENCE & MEDICINE Volume: 229 Pages: 134-143 Special Issue: SI DOI: 10.1016/j.socscimed.2018.08.022 Published: MAY 2019 Document Type:Article

Abstract: Neighborhood plays an important role in the provision of elderly care in the context of rapid population aging and dwindling traditional family support in China. This study investigates the association between neighborhood characteristics and depression and its mechanisms among older adults in Shanghai, focusing on social cohesion and social engagement. Based on data from the first wave of Shanghai Urban Neighborhood Survey (SUNS), we show that social cohesion is a channel through which neighborhood attributes are linked with the elderly's subjective well-being. Different from findings in Western societies, Chinese older adults living in neighborhoods of lower socioeconomic status are more likely to interact with their neighbors and thus perceive a higher level of social cohesion. Social cohesion, in turn, is associated with a lower rate of depression. We argue that housing policy in the pre-reform period that integrated work and housing led to the formation of unique Chinese neighborhoods, and that those living in socioeconomically disadvantaged neighborhoods have strong social ties, which moderate the negative consequences of living in a disadvantaged one. Moreover, a neighborhood with a lower dependency ratio provides more opportunities for volunteer participation which significantly associates with increased social cohesion and decreased depressive symptoms.

#### **Record 72**

Title: A sustainable urban design framework for the suburbanisation of coastal southeaster Australia

Author(s): Shao, JZ (Shao, Jizhong)[ 1,2 ] ; Hu, ZY (Hu, Zhenyu)[ 1 ] ; Li, BH (Li, Baihao)[ 2 ] ; Luo, J (Luo, Jing)[ 1 ] ; Xi, JR (Xi, Jiaoru)[ 1 ]

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Volume: 26 Issue: 14 Pages: 13931-13947 DOI: 10.1007/s11356-019-04879-8 Published: MAY 2019 Document Type:Article

Abstract: The suburbanisation of modern cities has forced many people in locations that are far less accessible than their prior residences, requiring motorised massive transport. Sustainable suburban development characteristics proposed to be relevant to transit-oriented development (TOD) are defined,

including walking and cycling, population density, employment opportunities, urban form, open space and mixed-use land. In the study, an urban design proposal of Reedy Creek Town Centre is intended to guide the sustainable development of the outlying community as an integrated and dense urban centre based around the new rail station. Moreover, a range of residential development choices and commercial office uses supported by convenience retailing and associated services are providing for a diverse range of people having varying incomes and social interests who live and work in suburban area. This paper, which builds on the work of transit-oriented community proposal by dissecting the principles and approaches of TOD, establishes an urban design framework for suburban development to reveal the key sustainability strategies. The result concludes that transit-oriented development holds considerable promise for placing rapidly suburbanising cities on more comprehensive sustainable strategies, which give a basis to guide appropriate growth, change and development, and to prevent development inconsistency.

### **Record 73**

Title: A scoping review on the relations between urban form and health: a focus on Canadian quantitative evidence

Author(s): McCormack, GR (McCormack, Gavin R.)[ 1,2 ] ; Cabaj, J (Cabaj, Jason)[ 1,3 ] ; Orpana, H (Orpana, Heather)[ 4,5 ] ; Lukic, R (Lukic, Ryan)[ 1 ] ; Blackstaffe, A (Blackstaffe, Anita)[ 1 ] ; Goopy, S (Goopy, Suzanne)[ 6 ] ; Hagel, B (Hagel, Brent)[ 1,10 ] ; Keough, N (Keough, Noel)[ 2 ] ; Martinson, R (Martinson, Ryan)[ 7 ] ; Chapman, J (Chapman, Jonathan)[ 8 ] ; Lee, C (Lee, Celia)[ 9 ] ; Tang, J (Tang, Joyce)[ 7 ] ; Fabreau, G (Fabreau, Gabriel)[ 1 ]

Source: HEALTH PROMOTION AND CHRONIC DISEASE PREVENTION IN CANADA-RESEARCH POLICY AND PRACTICE Volume: 39 Issue: 5 Pages: 187-200 DOI: 10.24095/hpcdp.39.5.03 Published: MAY 2019 Document Type:Review

Abstract: Introduction: Despite the accumulating Canadian evidence regarding the relations between urban form and health behaviours, less is known about the associations between urban form and health conditions. Our study aim was to undertake a scoping review to synthesize evidence from quantitative studies that have investigated the relationship between built environment and chronic health conditions, self-reported health and quality of life, and injuries in the Canadian adult population. Methods: From January to March 2017, we searched 13 databases to identify peer-reviewed quantitative studies from all years that estimated associations between the objectively-measured built environment and health conditions in Canadian adults. Studies undertaken within urban settings only were included. Relevant studies were catalogued and synthesized in relation to their reported study and sample design, and health outcome and built environment features. Results: Fifty-five articles met the inclusion criteria, 52 of which were published after 2008. Most single province studies were undertaken in Ontario (n = 22), Quebec (n = 12), and Alberta (n = 7). Associations between the built environment features and 11 broad health outcomes emerged from the review, including injury (n = 19), weight status (n = 19), cardiovascular disease (n = 5), depression/anxiety (n = 5), diabetes (n = 5), mortality (n = 4), self-rated health (n = 2), chronic conditions (n = 2), metabolic conditions (n = 2), quality of life (n = 1), and cancer (n = 1). Consistent evidence for associations between aggregate built environment indicators (e.g., walkability) and diabetes and weight and between connectivity and route features (e.g., transportation route, trails, pathways, sidewalks, street pattern, intersections, route characteristics) and injury were found. Evidence for greenspace, parks and recreation features impacting multiple health outcomes was also found. Conclusion: Within the Canadian context, the built environment is associated with a range of chronic health conditions and injury in adults, but the evidence to date has limitations. More research on the built environment and health incorporating rigorous study designs are needed to provide stronger causal evidence to inform policy and practice.

### **Record 74**

Title: Local communities' perceptions and use of urban green infrastructure in two Ethiopian cities: Bahir Dar and Hawassa

Author(s): Gashu, K (Gashu, Kassahun)[ 1 ] ; Gebre-Egziabher, T (Gebre-Egziabher, Tegegne)[ 2 ] ; Wubneh, M (Wubneh, Mulatu)[ 3 ]

Source: JOURNAL OF ENVIRONMENTAL PLANNING AND MANAGEMENT DOI: 10.1080/09640568.2019.1578643 Early Access: APR 2019 Document Type:Article

Abstract: The main objective of this study is to examine local communities' perceptions and use of green infrastructure (GI) in two case study cities: Bahir Dar and Hawassa in Ethiopia. The study employed a binary logistic regression model to identify factors that affect perceptions of GI. The result shows that people have distinct patterns of usage and positive perceptions towards GI in their respective cities. The regression results show that gender, age, accessibility, safety, education level, type of green infrastructure, level of awareness, location and opportunities for social activities are statistically significant predictors of perception. It is evident that urban GI development that addresses local communities' perceptions needs to be sensitive to these variables.

## Record 75

Title: Neighbourhood walkability and the incidence of diabetes: an inverse probability of treatment weighting analysis

Author(s): Booth, GL (Booth, Gillian L.)[ 1,2,3,4,5 ] ; Creatore, MI (Creatore, Maria I.)[ 6 ] ; Luo, J (Luo, Jin)[ 2 ] ; Fazli, GS (Fazli, Ghazal S.)[ 1,2,3 ] ; Johns, A (Johns, Ashley)[ 1 ] ; Rosella, LC (Rosella, Laura C.)[ 2,3,6 ] ; Glazier, RH (Glazier, Richard H.)[ 1,2,3,6,7,8 ] ; Moineddin, R (Moineddin, Rahim)[ 2,3,7 ] ; Gozdyra, P (Gozdyra, Peter)[ 1,2 ] ; Austin, PC (Austin, Peter C.)[ 2,3 ]

Source: JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH Volume: 73 Issue: 4 Pages: 287-294 DOI: 10.1136/jech-2018-210510 Published: APR 2019 Document Type:Article

Abstract: Background People living in highly walkable neighbourhoods tend to be more physically active and less likely to be obese. Whether walkable urban design reduces the future risk of diabetes is less clear. Methods We used inverse probability of treatment weighting to compare 10-year diabetes incidence between residents living in high-walkability and lowwalkability neighbourhoods within five urban regions in Ontario, Canada. Adults (aged 30-85 years) who were diabetes-free on 1 April 2002 were identified from administrative health databases and followed until 31 March 2012 (n= 958 567). Within each region, weights reflecting the propensity to live in each neighbourhood type were created based on sociodemographic characteristics, comorbidities and healthcare utilisation and incorporated into region-specific Cox proportional hazards models. Results Low-walkability areas were more affluent and had more South Asian residents (6.4% vs3.6%, p< 0.001) but fewer residents from other minority groups (16.6% vs21.7%, p< 0.001). Baseline characteristics were well balanced between low-walkability and highwalkability neighbourhoods after applying individual weights (standardised differences all < 0.1). In each region, high walkability was associated with lower diabetes incidence among adults aged < 65 years (overall weighted incidence: 8.2vs9.2 per 1000; HR 0.85, 95% CI 0.78 to 0.93), but not among adults aged = 65 years (weighted incidence: 20.7vs19.5 per 1000; HR 1.01, 95% CI 0.91 to 1.12). Findings were consistent regardless of income and immigration status. Conclusions Younger adults living in high-walkability neighbourhoods had a lower 10-year incidence of diabetes than similarly aged adults living in lowwalkability neighbourhoods. Urban designs that support walking may have important benefits for diabetes prevention.

## Record 76

Title: Can green space quantity and quality help prevent postpartum weight gain? A longitudinal study

Author(s): Feng, XQ (Feng, Xiaoqi)[ 1,2,3,4 ] ; Astell-Burt, T (Astell-Burt, Thomas)[ 1,2,3,4,5 ]

Source: JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH Volume: 73 Issue: 4 Pages: 295-302 DOI: 10.1136/jech-2018-211133 Published: APR 2019 Document Type:Article

**Abstract:** Background Postpartum weight gain is a well-known challenge for many mothers, but associations with green space quantity and quality have not been investigated. Methods This longitudinal study used data on 3843 mothers living in Australia tracked biennially for 15 years post partum from 2004 onwards. Multilevel growth curve models adjusted for confounding were used to examine the patterning of body mass index (BMI) in relation to green space quantity, measured by percentage land use, and green space quality, measured by self-report. Twoway interaction terms were fitted to investigate timecontingent associations between BMI and green space. Results Compared with mothers in areas with = 5% green space, adjusted BMI coefficients were -0.43 kg/m(2) (SE 0.37), -0.69 kg/m(2) (SE 0.32) -0.86 kg/ m(2) (SE 0.33) and -0.80 kg/m(2) (SE 0.41) among mothers in areas with 6%-10%, 11%-20%, 21%-40% and = 41% green space, respectively. There were no independent associations between BMI and green space quality. Evidence suggested mothers living in areas with 21%-40% green space had the lowest BMI, whether they agreed that local parks were good quality (-0.89 kg/m(2) (SE 0.34)) or not (-0.93 kg/m(2) (SE 0.35)). Mothers in the greenest areas only had statistically significantly lower BMI if they perceived local parks as high quality (-0.89 kg/m(2) (SE 0.41)). There was limited evidence that these associations varied with respect to the number of years post partum. Conclusion These findings may suggest that urban greening strategies to achieve a threshold of at least 21% or more green space in an area may help reduce, but not fully prevent postpartum weight gain. Potential mechanisms warrant investigation.

## Record 77

**Title:** Characteristics of the built environment and spatial patterning of type 2 diabetes in the urban core of Durham, North Carolina

**Author(s):** Bravo, MA (Bravo, Mercedes A.)[ 1,2 ] ; Anthopolos, R (Anthopolos, Rebecca)[ 1 ] ; Miranda, ML (Miranda, Marie Lynn)[ 1,2 ]

**Source:** JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH Volume: 73 Issue: 4 Pages: 303-310 DOI: 10.1136/jech-2018-211064 Published: APR 2019 Document Type:Article

**Abstract:** Background Few studies examine relationships between built environment (BE) and type 2 diabetes mellitus (T2DM) using spatial models, investigate BE domains apart from food environment or physical activity resources or conduct sensitivity analysis of methodological choices made in measuring BE. We examine geographic heterogeneity of T2DM, describe how heterogeneity in T2DM relates to BE and estimate associations of T2DM with BE. Methods Individual-level electronic health records (n=41 203) from the Duke Medicine Enterprise Data Warehouse (2007-2011) were linked to BE based on census block. Data on housing damage, property disorder, territoriality, vacancy and public nuisances were used to estimate BE based on four different construction methods (CMs). We used race-stratified aspatial and spatial Bayesian models to assess geographic heterogeneity in T2DM and associations of T2DM with BE. Results Among whites, a 1 SD increase in poor quality BE was associated with a 1.03 (95% credible interval 1.01 to 1.06) and 1.06 (95 % credible interval 1.02 to 1.11) increased risk of T2DM for poor quality BE CM1 and CM2, respectively. Among blacks/African Americans, associations between T2DM and BE overlapped with the null for all CMs. The addition of BE to white models reduced residual geographic heterogeneity in T2DM by 4%-15%, depending on CM. In black/African-American models, BE did not affect residual heterogeneity. Conclusion Associations of T2DM with BE were sensitive to CM and geographic heterogeneity in T2DM differed by race/ethnicity. Findings underscore the need to consider multiple methods of estimating BE and consider differences in relationships by race/ ethnicity.

## Record 78

**Title:** Active travel for active ageing in China: The role of built environment

**Author(s):** Cheng, L (Cheng, Long)[ 1,2 ] ; Chen, XW (Chen, Xuewu)[ 1 ] ; Yang, S (Yang, Shuo)[ 1 ] ; Cao, Z (Cao, Zhan)[ 2 ] ; De Vos, J (De Vos, Jonas)[ 2 ] ; Witlox, F (Witlox, Frank)[ 2,3,4 ]

**Source:** JOURNAL OF TRANSPORT GEOGRAPHY Volume: 76 Pages: 142-152 DOI: 10.1016/j.jtrangeo.2019.03.010 Published: APR 2019 Document Type:Article

**Abstract:** China has been witnessing prominent demographic ageing because of its sustained low fertility (one-child policy) and mortality rates. In 2017, nearly one in four elderly adults in the world live in China. The rapid increase of the elderly population is supposed to dramatically influence the urban and transportation system. Active travel plays an important role for the ageing Chinese population to sustain their mobility and wellbeing. To provide suitable policy implications for age-friendly travel environments in China, this study investigates how the built environment affects active travel behavior. Particularly, we explore the influences of built environment on daily active travel frequency and time expenditure while taking into account travel attitudes. A zero-inflated ordered probit model and a Cox proportional hazards model are respectively estimated based on the Nanjing Travel Survey data. Results show that the social and cultural contexts exert pronounced impacts on the travel pattern of Chinese older people. Specifically, it is found that the living pattern of co-residence, and the proximity to market, park/square, and chess/card room are influential in shaping active travel patterns. In addition, the built environment shows larger effects on the active travel behavior of older adults than on that of young people. Attitudes towards active travel are not significant in explaining the senior's travel behavior, indicating limited self-selection effects. The findings will offer insights to establish effective and appropriate land use strategies and public facility distribution for the elderly during the Chinese urban renewal process.

## **Record 79**

**Title:** Using walkability measures to identify train stations with the potential to become transit oriented developments located in walkable neighbourhoods

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**Source:** JOURNAL OF TRANSPORT GEOGRAPHY Volume: 76 Pages: 221-231 DOI: 10.1016/j.jtrangeo.2019.03.009 Published: APR 2019 Document Type:Article

**Abstract:** Classifying train stations into typologies is a useful way to simplify their complex characteristics to assess their potential to become Transit Oriented Developments (TODs). However, researchers are yet to fully explore the walkability of train station neighbourhoods. Walkable areas have many features but typically include high residential density, greater street connectivity, and mixed land uses. Such characteristics facilitate access to the train station and can indicate both the effectiveness and potential of a train station to function as a TOD. This research explores the walkability of 230 train stations in metropolitan Melbourne, Australia using 14 different walkability measures. A two-stage cluster analysis was employed to group the train stations to determine their degree of walkability. The train station typology was validated using train station patronage data by different transport modes. Three clusters were found: cluster 1 train stations were more walkable and generally located in inner city areas, whilst those in cluster 2 were the least walkable and were generally located in middle and outer suburban areas. Cluster 3 train stations had the most potential for development as a TOD, having similar walkability features to those in cluster 1 but more car parking facilities and local living destinations when compared with the least walkable cluster 2 train stations. These findings suggest potential for cluster 3 train stations to become TODs, particularly if residential densities were increased in the surrounding neighbourhood. The patronage data validated the cluster findings in that the most walkable cluster 1 train stations had the highest percentage of pedestrian entries. TODs offer a way for planners to increase public transit use by co-locating a variety of services, destinations, residences and places of employment. Our findings provide a typology useful for exploring development strategies for developing train stations into TOD as a means of managing population growth and creating healthy, liveable and sustainable cities.

## **Record 80**

**Title:** Nudging people towards more sustainable residential choice decisions: an intervention based on focalism and visualization

**Author(s):** Bhattacharyya, A (Bhattacharyya, Abhinav)[ 1 ] ; Jin, W (Jin, Wen)[ 4 ] ; Le Floch, C (Le Floch, Caroline)[ 1 ] ; Chatman, DG (Chatman, Daniel G.)[ 2 ] ; Walker, JL (Walker, Joan L.)[ 3 ]

Source: TRANSPORTATION Volume: 46 Issue: 2 Pages: 373-393 Special Issue: SI DOI: 10.1007/s11116-018-9936-x Published: APR 2019 Document Type:Article; Proceedings Paper View Journal Impact Conference Conference: 14th International Conference of the International-Association-of-Travel-Behavior-Research (IATBR) on Travel Behaviour Research Location: Windsor, ENGLAND Date: JUL, 2015 Sponsor(s):Int Assoc Travel Behav Res

Abstract: There have been numerous behavior change studies focused on sustainable travel mode choices. In this study we focused on the residential choices that in turn influence travel habits. We designed and implemented two interventions, which we term the focalism and visualization interventions, based on literature in psychological economics. The focalism intervention was motivated by literature that suggests people make suboptimal choices when looking for a new home. While focus is given to immediately tangible features like the quality of the house, important but less tangible factors like access to transportation are relatively overlooked. The visualization intervention was based on literature showing that providing information at decision points when long-ingrained habits are vulnerable to change, such as at the time of a residential move, can be influential on choices. We designed both interventions to be interactive so that the intervention was discovered by respondents rather than presented directly as information. With the focalism intervention, we pointed out differences in how respondents ranked their search priorities for new housing and neighborhoods, versus how they ranked what they reported makes them happy. With the visualization intervention, we explained to respondents that moving is an opportunity to make changes in one's life, and we prompted them to think through what they desired to change. We evaluated the influence of these interventions on residential housing decisions by surveying respondents about their priorities in residential search before and after the interventions, and by collecting information about their housing, neighborhoods, travel patterns, and reported well-being. The surveys were web-based, with one survey conducted before respondents moved and a second survey conducted afterward. Participants were randomly assigned to a focalism treatment group, a visualization treatment group, or a control group. 380 respondents answered the pre-move survey, and 184 of these answered the post-move survey. In the pre-move survey, we found that both the focalism and visualization interventions resulted in a significant increase in the fraction of people who planned to travel more sustainably relative to the control group. More importantly, we found that after the post-move survey, respondents in the focalism group, but not the visualization group, significantly reduced their travel time to work and increased their cycling, walking, carpooling, carsharing and transit use in comparison to the control group. Meanwhile, those in the visualization treatment group had significantly higher reported well-being after the move; those in the focalism treatment group also improved their stated well-being, though less significantly; and there was no change in the control group. These results suggest that it might be relatively easy to nudge residential choices towards both more sustainable travel and greater well-being.

## **Record 81**

Title: Have walking and bicycling increased in the US? A 13-year longitudinal analysis of traffic counts from 13 metropolitan areas

Author(s): Le, HTK (Le, Huyen T. K.)[ 1 ] ; Buehler, R (Buehler, Ralph)[ 2 ] ; Hankey, S (Hankey, Steve)[ 1 ]

Source: TRANSPORTATION RESEARCH PART D-TRANSPORT AND ENVIRONMENT Volume: 69 Pages: 329-345 DOI: 10.1016/j.trd.2019.02.006 Published: APR 2019 Document Type:Article

Abstract: Local, state, and federal governments promote walking and bicycling in order to reduce emissions and improve public health. Tracking rates of bicycling and walking over time is important for assessing progress towards this goal. In the United States, most data are limited to cross-sectional self-report surveys (e.g., National Household Travel Surveys [NHTS]) or capture only the main commute mode (e.g., American Community Survey [ACS]). This study examines temporal trends (while controlling for spatial factors) of active travel in 13 US metropolitan areas between 2004 and 2016 (with 78% of counts occurring between 2010 and 2016) using repeated counts of bicycle and pedestrian traffic (n = 1319 count locations; 5554 bicycle and 5166 pedestrian counts). We used multilevel mixed-effects models to examine the multi-year trend in bicycling and walking during morning and afternoon peak periods. In the 5 out of 8 models where the temporal trend was statistically significant, we found that, on average, traffic volumes increased at a

rate of 2-6% (bicycle) and 2-3% (pedestrian) per year among count locations, holding other variables constant. Presence of bicycle facilities (e.g., bicycle lanes, off-street trails) was positively associated with higher levels of bicycle traffic. Our results based on observed traffic patterns suggest larger increases in bicycling and walking as compared to the trends reported from the NHTS and ACS data. Quantifying the temporal trend from observed counts of traffic may aid policy makers and urban planners in assessing progress towards the goal of increasing bicycling and walking to reduce emissions and increase physical activity.

## **Record 82**

Title: Physical and emotional support of the neighborhood for older adults: A comparison of the United States and Germany

Author(s): Konig, K (Konig, Katharina)[ 1 ] ; Raue, M (Raue, Martina)[ 1 ] ; D'Ambrosio, LA (D'Ambrosio, Lisa A.)[ 1 ] ; Coughlin, JF (Coughlin, Joseph F.)[ 1 ]

Source: JOURNAL OF ENVIRONMENTAL PSYCHOLOGY Volume: 62 Pages: 84-94 DOI: 10.1016/j.jenvp.2019.01.008 Published: APR 2019 Document Type:Article

Abstract: The living environment plays a critical role in healthy aging. As older adults' physical abilities decrease, they are less likely to compensate for physical barriers and their action radius decreases. Therefore, older adults strongly depend on the neighborhood to meet their needs. The neighborhood environment also has a role to play in the fulfillment of older adults' emotional needs, which are key to successful aging in place. Further, historical differences in the built environment in the United States vs. Europe may lead to different expectations of need fulfillment in different countries. The aim of this study was to shed light on older adults' (N = 577, ages 70+) living situations and their demands on the neighborhood in two countries, the United States (n = 350) and Germany (n = 227). Differences between countries were more pronounced than differences between age groups or living areas, indicating that cultural influence is a key aspect of needs assessment for neighborhood design. In line with the literature in environmental gerontology, participants' needs spanned across various dimensions related to the physical, social and psychological environment, which we categorized into global, local, and social needs. As opposed to Americans, Germans had higher expectations of their immediate neighborhood to fulfill their local (e.g., public transportation) and social needs (e.g., family nearby), but countries did not differ regarding global needs such as safety. Our findings suggest that successful aging in place can be supported by a neighborhood that takes people's cultural backgrounds into consideration when defining and meeting their needs.

## **Record 83**

Title: Are urban landscapes associated with reported life satisfaction and inequalities in life satisfaction at the city level? A cross-sectional study of 66 European cities

Author(s): Olsen, JR (Olsen, Jonathan R.)[ 1 ] ; Nicholls, N (Nicholls, Natalie)[ 1 ] ; Mitchell, R (Mitchell, Richard)[ 1 ]

Source: SOCIAL SCIENCE & MEDICINE Volume: 226 Pages: 263-274 DOI: 10.1016/j.socscimed.2019.03.009 Published: APR 2019 Document Type:Article

Abstract: With more than half the world's population residing in urban areas and this proportion rising, it is important to understand how well-planned urban environments might improve, and reduce inequalities in, quality of life (QoL). Although studies suggest city-level characteristics hold independent influence on QoL, they generally lack a theoretically informed approach to understanding how the whole city landscape might be implicated, have paid scant attention to inequalities in QoL and often focus on small numbers of cities or countries. We applied theory and methods from landscape ecology to explore associations between cities' land cover/use, residents' reported life satisfaction and within-city socio-economic inequalities in life satisfaction. We joined individual level responses to the European Urban Audit (EUA) Perception Surveys (2012, 2015) with city-level data from the European Urban Atlas classifying land cover/use into 26 different

classes. Our sample included 63,554 people from 66 cities in 28 countries. Multilevel binary logistic models found that specific land use measures were associated with life satisfaction, including the amount of a city which was: residential (OR:0.991, 95%CI 0.984-0.997); isolated structures (OR:1.046, 95 CI 1.002-1.091); roads (OR:0.989, 95%CI 0.982-0.996); pastures (OR: 1.002, 95% CI 1.002-1.003) and herbaceous vegetation (OR:0.998, 95%CI 0.997-0.100). A more even distribution of land cover/use (beta: 1.561, 95%CI-3.021 to 0.102) was associated with lower inequality in life satisfaction. This is the first study to theorise and examine how the entire urban landscape may affect levels of and inequalities in wellbeing in a large international sample. Our finding that more equal distribution of land cover/use is associated with lower levels of socio-economic inequality in life satisfaction supports the idea that city environments could be equigenic that is, could create equality. Our findings can aid urban planners to develop and build cities that can contribute to improving, and narrowing inequalities in, residents' life satisfaction.

#### **Record 84**

Title: Diversity and burglary: Do community differences matter?

Author(s): Gulma, UL (Gulma, Usman L.) [ 1 ] ; Evans, A (Evans, Andy) [ 1 ] ; Heppenstall, A (Heppenstall, Alison) [ 1 ] ; Malleson, N (Malleson, Nick) [ 1 ]

Source: TRANSACTIONS IN GIS Volume: 23 Issue: 2 Pages: 181-202 DOI: 10.1111/tgis.12511 Published: APR 2019 Document Type:Article

Abstract: Diversity within a population has been linked to levels of both social cohesion and crime. Neighborhood crimes are the result of a complex set of factors, one of which is weak community cohesion. This article seeks to explore the impacts of diversity on burglary crime in a range of neighborhoods, using Leeds, UK as a case study. We propose a new approach to quantifying the correlates of burglary in urban areas through the use of diversity metrics. This approach is useful in unveiling the relationship between burglary and diversity in urban communities. Specifically, we employ stepwise multiple regression models to quantify the relationships between a number of neighborhood diversity variables and burglary crime rates. The results of the analyses show that the variables that represent diversity were more significant when regressed against burglary crime rates than standard socio-demographic data traditionally used in crime studies, which do not generally use diversity variables. The findings of this study highlight the importance of neighborhood cohesion in the crime system, and the key place for diversity statistics in quantifying the relationships between neighborhood diversities and burglary. The study highlights the importance of policy planning aimed at encouraging community building in promoting neighborhood safety.

#### **Record 85**

Title: Climate change, health and green space co-benefits

Author(s): Kingsley, M (Kingsley, Marianne) [ 1 ] Group Author(s): EcoHlth Ontario

Source: HEALTH PROMOTION AND CHRONIC DISEASE PREVENTION IN CANADA-RESEARCH POLICY AND PRACTICE Volume: 39 Issue: 4 Pages: 131-135 Special Issue: SI DOI: 10.24095/hpcdp.39.4.04 Published: APR 2019 Document Type:Editorial Material

Abstract: We examined two of humanity's present-day challenges, climate change and chronic diseases, in relation to the co-benefits that green spaces provide to human health and the environment. The reduction of several chronic diseases and associated symptoms, including anxiety, obesity and cardiovascular disease, has been associated with the presence of and access to green space. Green spaces also contribute to a number of environmental health benefits and have been shown to reduce the likelihood of flooding, improve air quality and provide cooling and shade. These co-benefits address both the symptoms of several chronic diseases and associated risk factors along with the environmental and health impacts of climate change. This article explores how to maximize the co-benefits of green spaces through two examples of multi-sectoral collaborations. With these two examples, we have provided a model of collective collaboration that aims to address complex issues, such as climate change and chronic diseases, through the common intervention of green spaces.

## Record 86

Title: Spatial Considerations for Implementing Two Direct-to-Consumer Food Models in Two States

Author(s): Sitaker, M (Sitaker, Marilyn)[ 1 ] ; McGuirt, JT (McGuirt, Jared T.)[ 2 ] ; Wang, WW (Wang, Weiwei)[ 3 ] ; Kolodinsky, J (Kolodinsky, Jane)[ 3 ] ; Seguin, RA (Seguin, Rebecca A.)[ 4 ]

Source: SUSTAINABILITY Volume: 11 Issue: 7 Article Number: 2081 DOI: 10.3390/su11072081  
Published: APR 1 2019 Document Type:Article

Abstract: To open new markets, some farmers have adapted direct-to-consumer (DTC) models, such as Community Supported Agriculture (CSA), to reach new settings or audiences. We compared sociodemographic and geospatial contexts to farmers' experience with one of two DTC innovations: a cost-offset CSA for low-income families and food boxes distributed through rural convenience stores. We geocoded addresses of thirteen farms and DTC pickup sites in two U.S. states (Vermont and Washington) and calculated road network distances from pickup to supermarket, farmers' market, and farm. We compiled Census block-level demographic and transportation data, and compared it to postseason interviews to explore the effect of suitability of the pickup location; proximity to food retail; and potential farmer burden. Most pickup areas were heavily car-dependent, with low walkability and few public transportation options. Conventional sources of fresh produce were within six miles of most pickups, but farmers markets were further away. Despite modest profitability, both models were deemed worth pursuing, as they expanded farmers' customer base. Farmers implementing the store-distributed food box were sensitive to market trends and customer needs in choosing pickup location. Farmers seemed more concerned with marketing in convenience store settings, and finding efficient ways to conduct recordkeeping than with delivery distances.

## Record 87

Title: Neighborhood Environment, Lifestyle, and Health of Older Adults: Comparison of Age Groups Based on Ecological Model of Aging

Author(s): Zheng, ZH (Zheng, Zhenhua)[ 1 ] ; Yang, L (Yang, Liu (Lydia))[ 1 ]

Source: SUSTAINABILITY Volume: 11 Issue: 7 Article Number: 2077 DOI: 10.3390/su11072077  
Published: APR 1 2019 Document Type:Article

Abstract: Worldwide population aging is currently in acceleration, which is especially true for China. Echoing the advocacy of active aging and age-friendly communities, governments and researchers across the world are paying more attention to the impact of neighborhoods on the health of older adults. Using the Ecological Model of Aging, this study aimed to discuss the relationships between neighborhood environment, lifestyle, and health of older adults, and to compare the differences among older adults of different age groups. The results showed that landscape environment has a direct effect on the health of older adults, while leisure environment has an indirect effect through lifestyle. Both leisure environment and landscape environment directly encourage older adults to take part in outdoor activity, in which the former mainly promotes the social participation of the high-aged (aged 80+) group, while the latter merely promotes that of the middle-aged (aged 70-79) group. The positive effect of social participation on health is gradually strengthened with the increase of age. Meanwhile, outdoor activity has its greatest effect on the middle-aged (aged 70-79) group, but not the low-aged (aged 60-69) group. To effectively boost the health of older adults and promote active aging, adequate considerations should also be given to the differentiated demands of older adults of different age groups, optimization of neighborhood environment, as well as cultivation of an amicable atmosphere.